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SEARCH REQUEST FORM

97045

Scientific and Technical Information Center

Requester's Full Name: HELEN PIZZUTO Examiner #: 70058 Date: 6/17/03  
Art Unit: 1713 Phone Number 30 8-2393 Serial Number: 10/061 423  
Mail Box and Bldg/Room Location: LP3-8B16 Results Format Preferred (circle): PAPER DISK E-MAIL

If more than one search is submitted, please prioritize searches in order of need.

\*\*\*\*\*  
Please provide a detailed statement of the search topic, and describe as specifically as possible the subject matter to be searched. Include the elected species or structures, keywords, synonyms, acronyms, and registry numbers, and combine with the concept or utility of the invention. Define any terms that may have a special meaning. Give examples or relevant citations, authors, etc, if known. Please attach a copy of the cover sheet, pertinent claims, and abstract.

Title of Invention: SEE ATTACHED

Inventors (please provide full names):

↓  
Earliest Priority Filing Date: 2/01/02

\*For Sequence Searches Only\* Please include all pertinent information (parent, child, divisional, or issued patent numbers) along with the appropriate serial number.

N, N - dialkyl alkoxamines as shown in Structure (II) in claim 2 & Structure (I) in claim 3. Nanomer species are in claim 4-5 compound is used as a free radical initiator for polymerization of (meth)acrylic acid or esters thereof (see claim 10)

KEY WORDS

initiator, coating, powder coating

Please attach search report pages submitted herein. Thanks!

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|  | Type of Search         | Vendors and cost where applicable |
|--|------------------------|-----------------------------------|
| Searcher: <u>R. Fuller</u>             | NA Sequence (#) _____  | STN <u>6/19/03</u>                |
| Searcher Phone #: _____                | AA Sequence (#) _____  | Dialog _____                      |
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| Date Searcher Picked Up: _____         | Bibliographic _____    | Dr. Link _____                    |
| Date Completed: <u>6/19/03</u>         | Litigation _____       | Lexis/Nexis _____                 |
| Searcher Prep & Review Time: <u>30</u> | Fulltext _____         | Sequence Systems _____            |
| Clerical Prep Time: _____              | Patent Family _____    | WWW/Internet _____                |
| Online Time: <u>69</u>                 | Other _____            | Other (specify) _____             |

subset

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DICTIONARY FILE UPDATES: 18 JUN 2003 HIGHEST RN 533863-98-8

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Experimental and calculated property data are now available. See HELP  
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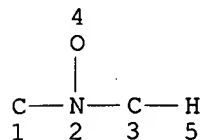
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=> D QUE

L10 SCR 2016 OR 2021  
L12 STR



8,770 structures from  
query

NODE ATTRIBUTES:

NSPEC IS RC AT 1  
NSPEC IS RC AT 3  
DEFAULT MLEVEL IS ATOM  
DEFAULT ECLEVEL IS LIMITED

GRAPH ATTRIBUTES:

RING(S) ARE ISOLATED OR EMBEDDED  
NUMBER OF NODES IS 5

STEREO ATTRIBUTES: NONE

L15 8770 SEA FILE=REGISTRY SSS FUL L12 AND L10  
L16 STR

Hy 1

*Subset search to  
remove heterocyclic  
rings*

NODE ATTRIBUTES:

DEFAULT MLEVEL IS ATOM  
DEFAULT ECLEVEL IS LIMITED

GRAPH ATTRIBUTES:

RING(S) ARE ISOLATED OR EMBEDDED  
NUMBER OF NODES IS 1

STEREO ATTRIBUTES: NONE

L18 5340 SEA FILE=REGISTRY SUB=L15 SSS FUL L16  
L19 3430 SEA FILE=REGISTRY ABB=ON L15 NOT L18  
L20 2059 SEA FILE=HCAPLUS ABB=ON L19  
L21 18 SEA FILE=HCAPLUS ABB=ON L20(L) INITIAT?  
L22 36 SEA FILE=HCAPLUS ABB=ON L20 AND FREE?(3A) RADICAL?(L) POLYMERI?  
  
L23 47 SEA FILE=HCAPLUS ABB=ON L20 AND ?ACRYL?(L) POLYMERI?  
L25 2 SEA FILE=HCAPLUS ABB=ON L23 AND COAT?/SC, SX, AB, BI  
L26 34 SEA FILE=HCAPLUS ABB=ON L23 AND (FREE?(3A) RAD? OR INITIAT?)  
L27 58 SEA FILE=HCAPLUS ABB=ON L20(L) CAT/RL  
L28 38 SEA FILE=HCAPLUS ABB=ON L23 AND L27  
L29 61 SEA FILE=HCAPLUS ABB=ON L21 OR L22 OR L25 OR L26 OR L28  
L30 23 SEA FILE=HCAPLUS ABB=ON L23 AND INITIAT?  
L31 61 SEA FILE=HCAPLUS ABB=ON L29 OR L30  
L32 59 SEA FILE=HCAPLUS ABB=ON L31 AND (POLYMER? OR PLASTIC?)/SC, SX

*3, 430 structures*

=> D L32 ALL HITSTR 1-59

*59 CA references with  
utility*

L32 ANSWER 1 OF 59 HCAPLUS COPYRIGHT 2003 ACS  
AN 2003:301111 HCAPLUS  
DN 138:321747  
TI Controlled copolymerization processes in the presence of  
monomer-containing complexes  
IN Matyjaszewski, Krzysztof; Kirci, Betul; Lutz, Jean-Francois; Pintauer,  
Tomislav  
PA Carnegie Mellon University, USA  
SO PCT Int. Appl., 69 pp.  
CODEN: PIXXD2  
DT Patent  
LA English  
IC ICM C08F004-00  
CC 35-4 (Chemistry of Synthetic High Polymers)

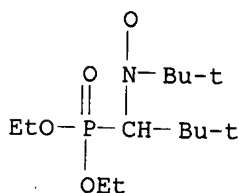


Section cross-reference(s): 29, 67

FAN.CNT 1

|      | PATENT NO.  | KIND   | DATE     | APPLICATION NO. | DATE     |
|------|---|--|----------|-----------------|----------|
| PI   | WO 2003031480   | A2   | 20030417 | WO 2002-US32526 | 20021011 |
|      | W:  | AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VN, YU, ZA, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG |          |                 |          |
| PRAI | US 2001-329210P   | P  | 20011012 |                 |          |
| AB   | A <b>polymn.</b> process comprises <b>polymg.</b> first monomers and second monomers under controlled <b>polymn.</b> conditions in the presence of a complex comprising at least one of the monomers. The presence of the complex modifies the relative reactivity, or cross propagation rate consts., of the monomers in copolymn. reactions. The method provides polymers with novel stereochem. and monomer sequence distribution, controlled mol. wt. and narrow mol. wt. distribution. Thus, a complex comprising Me <b>methacrylate</b> (1.86) and diethylaluminum chloride (0.89) was prepd. and used in RAFT copolymn. of styrene (1.93 g) and Me <b>methacrylate</b> , the <b>polymn.</b> being carried out at 60.degree. in the presence of AIBN and cumyl dithiobenzoate. Well-defined alternating Me <b>methacrylate</b> -styrene copolymer of controlled mol. wt. (20,000 g/mol), low polydispersity (Mw/Mn = 1.38) and controlled comonomer sequences (86.8% of alternating triads) was produced. |  |          |                 |          |
| ST   | monomer Lewis acid complex catalyst controlled RAFT polymn  |  |          |                 |          |
| IT   | Chain transfer agents<br>Polymerization<br>Polymerization catalysts<br>(controlled copolymn. processes in presence of monomer-contg. complexes)   |  |          |                 |          |
| IT   | Lewis acids<br>RL: CAT (Catalyst use); USES (Uses)<br>(controlled copolymn. processes in presence of monomer-contg. complexes)  |  |          |                 |          |
| IT   | 75-47-8, Iodoform 78-67-1, AIBN 96-10-6D, Diethylaluminum chloride, complexes with acrylates 624-75-9, Iodoacetonitrile 2564-83-2, TEMPO 12075-68-2D, Ethylaluminum sesquichloride, complexes with acrylates 188526-94-5, SG 1 201611-77-0, Cumyl dithiobenzoate<br>RL: CAT (Catalyst use); USES (Uses)<br>(controlled copolymn. processes in presence of monomer-contg. complexes)   |  |          |                 |          |
| IT   | 117894-30-1P, Methyl acrylate-styrene alternating copolymer 511313-38-5P<br>511313-39-6P<br>RL: IMF (Industrial manufacture); PREP (Preparation)<br>(controlled copolymn. processes in presence of monomer-contg. complexes)  |  |          |                 |          |
| IT   | 62694-18-2P, 1-Hexene-methyl methacrylate copolymer 107493-06-1P<br>108266-99-5P, Methyl methacrylate-styrene alternating copolymer<br>RL: IMF (Industrial manufacture); PRP (Properties); PREP (Preparation)<br>(controlled copolymn. processes in presence of monomer-contg. complexes)   |  |          |                 |          |
| IT   | 96-33-3, Methyl acrylate 143-66-8, Sodium tetraphenylborate 3030-47-5,  |  |          |                 |          |

- PMDETA. 7681-65-4, Copper monoiodide 7787-70-4, Copper monobromide  
 RL: RCT (Reactant); RACT (Reactant or reagent)  
 (in synthesis of monomer-contg. complexes for controlled copolymn.  
 processes)
- IT 511312-41-7P 511312-43-9P  
 RL: CAT (Catalyst use); IMF (Industrial manufacture); PREP (Preparation);  
 USES (Uses)  
 (synthesis of monomer-contg. complexes for controlled copolymn.  
 processes)
- IT 474267-90-8P 511312-39-3P  
 RL: CAT (Catalyst use); IMF (Industrial manufacture); PRP (Properties);  
 PREP (Preparation); USES (Uses)  
 (synthesis of monomer-contg. complexes for controlled copolymn.  
 processes)
- IT 188526-94-5, SG 1  
 RL: CAT (Catalyst use); USES (Uses)  
 (controlled copolymn. processes in presence of monomer-contg.  
 complexes)
- RN 188526-94-5 HCAPLUS
- CN Nitroxide, 1-(diethoxyphosphinyl)-2,2-dimethylpropyl 1,1-dimethylethyl  
 (9CI) (CA INDEX NAME)



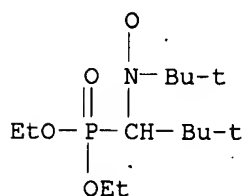
- L32 ANSWER 2 OF 59 HCAPLUS COPYRIGHT 2003 ACS
- AN 2003:222776 HCAPLUS
- DN 138:385804
- TI In situ FTIR monitoring of alkyl **acrylate** stable **free radical polymerizations**
- AU Lizotte, Jeremy R.; Long, Timothy E.
- CS Department of Chemistry and the Center for Adhesive and Sealant Science,  
 Virginia Polytechnic Institute and State University, Blacksburg, VA,  
 24061-0212, USA
- SO Polymeric Materials Science and Engineering (2003), 88, 471-472  
 CODEN: PMSE DG; ISSN: 0743-0515
- PB American Chemical Society
- DT Journal; (computer optical disk)
- LA English
- CC 35-3 (Chemistry of Synthetic High Polymers)
- AB The focus of this presentation is to demonstrate the utility of in situ  
 FTIR spectroscopy in the investigation of the SFRP of alkyl  
**acrylates**. In addn., the synthesis of a previously described  
 nitroxide mediator, N-tert-butyl-N-[1-diethylphosphono(2,2-  
 dimethylpropyl)]nitroxide (DEPN), is studied using FTIR. The homopolymn.  
 kinetics were investigated to elucidate the effect of alkyl ester chain  
 length on **polymn.** rate. Also, the copolymn. of multiple  
**acrylate** monomers was examd. with an emphasis on hydroxyethyl  
**acrylate** copolymns. for the prepn. of adhesive compns.
- ST stable **free radical polymn** catalyst

- nitroxide prepn; alkyl **acrylate polymn** kinetics in situ FTIR monitoring
- IT Nitroxides  
 RL: CAT (Catalyst use); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)  
 (prepn. of nitoxide **initiator** for in situ FTIR monitoring of alkyl acrylate stable **free radical** polymns.)
- IT **Polymerization**  
**Polymerization** catalysts  
**Polymerization** kinetics  
 (radical; prepn. of nitoxide **initiator** for in situ FTIR monitoring of alkyl **acrylate** stable **free radical** polymns.)
- IT 100-42-5, Styrene, reactions  
 RL: RCT (Reactant); RACT (Reactant or reagent)  
 (for comparison; prepn. of nitoxide **initiator** for in situ FTIR monitoring of alkyl acrylate stable **free radical** polymns.)
- IT 9003-53-6P, Polystyrene  
 RL: SPN (Synthetic preparation); PREP (Preparation)  
 (for comparison; prepn. of nitoxide **initiator** for in situ FTIR monitoring of alkyl acrylate stable **free radical** polymns.)
- IT 75-64-9, tert-Butylamine, reactions 630-19-3, Pivaldehyde 762-04-9, Diethyl phosphite  
 RL: RCT (Reactant); RACT (Reactant or reagent)  
 (in prepn. of nitoxide **initiator** for in situ FTIR monitoring of alkyl acrylate stable **free radical** polymns.)
- IT 937-14-4, m-Chloroperoxybenzoic acid  
 RL: RGT (Reagent); RACT (Reactant or reagent)  
 (in prepn. of nitoxide **initiator** for in situ FTIR monitoring of alkyl acrylate stable **free radical** polymns.)
- IT 188526-94-5P, N-tert-Butyl-[1-diethylphosphono(2,2-dimethylpropyl)]nitroxide  
 RL: CAT (Catalyst use); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)  
 (prepn. of nitoxide **initiator** for in situ FTIR monitoring of alkyl acrylate stable **free radical** polymns.)
- IT 103-11-7, 2-Ethylhexyl acrylate 1663-39-4, tert-Butyl acrylate  
 RL: RCT (Reactant); RACT (Reactant or reagent)  
 (prepn. of nitoxide **initiator** for in situ FTIR monitoring of alkyl acrylate stable **free radical** polymns.)
- IT 9003-77-4P, Poly(2-Ethylhexyl acrylate) 25232-27-3P, Poly(tert-butyl acrylate) 36089-45-9P, 2-Ethylhexyl acrylate-2-hydroxyethyl acrylate copolymer  
 RL: SPN (Synthetic preparation); PREP (Preparation)  
 (prepn. of nitoxide **initiator** for in situ FTIR monitoring of alkyl acrylate stable **free radical** polymns.)

RE.CNT 13 THERE ARE 13 CITED REFERENCES AVAILABLE FOR THIS RECORD  
 RE

- (1) Benoit, D; J Am Chem Soc 1999, V121, P3904 HCAPLUS
- (2) Chiefari, J; Macromolecules 1998, V31, P5559 HCAPLUS
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- (4) Georges, M; Macromolecules 1998, V31, P9087 HCAPLUS
- (5) Grimaldi, S; Macromolecules 2000, V33, P1141 HCAPLUS
- (6) Hawker, C; ACS Symp Ser Solvent-Free Polymerization and Processes 1998, V713, P127 HCAPLUS
- (7) Hawker, C; Macromolecules 1996, V29, P5245 HCAPLUS

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 (9) Listigovers, N; Macromolecules 1996, V29, P8992 HCAPLUS  
 (10) Lizotte, J; J Polym Sci:Part A: Polym Chem 2002, V40, P583 HCAPLUS  
 (11) Pasquale, A; Macromolecules 1999, V32, P7954 HCAPLUS  
 (12) Pasquale, A; Polym News 2002, V27, P272 HCAPLUS  
 (13) Wang, J; J Am Chem Soc 1995, V117, P5614 HCAPLUS  
 IT 188526-94-5P, N-tert-Butyl-[1-diethylphosphono(2,2-dimethylpropyl)]nitroxide  
 RL: CAT (Catalyst use); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)  
 (prepn. of nitroxide **initiator** for in situ FTIR monitoring of alkyl acrylate stable **free radical** polymns.)  
 RN 188526-94-5 HCAPLUS  
 CN Nitroxide, 1-(diethoxyphosphinyl)-2,2-dimethylpropyl 1,1-dimethylethyl (9CI) (CA INDEX NAME)



- L32 ANSWER 3 OF 59 HCAPLUS COPYRIGHT 2003 ACS  
 AN 2003:222695 HCAPLUS  
 DN 138:385801  
 TI Automatic continuous online monitoring of polymerization reactions (ACOMP) adapted to high viscosity reactions  
 AU Mignard, Emmanuel; Guerret, Olivier; Bertin, Denis; Reed, Wayne F.  
 CS Physics Department, Tulane University, New Orleans, LA, 70118, USA  
 SO Polymeric Materials Science and Engineering (2003), 88, 314-316  
 CODEN: PMSEDG; ISSN: 0743-0515  
 PB American Chemical Society  
 DT Journal; (computer optical disk)  
 LA English  
 CC 35-3 (Chemistry of Synthetic High **Polymers**)  
 Section cross-reference(s): 36  
 AB ACOMP was adapted to following polymn. reactions that reach high viscosity; tens of thousands of centipoise. This required introduction of either peristaltic or gear pumps, in addn. to the HPLC pumps previously used. Expanding ACOMP to high viscosities considerably broadens the range of the technique. Its use is illustrated here to follow bulk polystyrene reactions. The **initiator** used, ter-amylperoxy 2-ethylhexylcarbonate, had a lifetime less than the period for total monomer conversion, leading to a 'dead-end' reaction, in which a finite amt. of monomer remained after the **initiator** was exhausted. The kinetics and mol. mass evolution revealed by ACOMP quant. follow the predictions of the quasi-steady state approxn. in the limit of short **initiator** lifetime. Addnl., high viscosity ACOMP was extended to nitroxide mediated homo- and copolymn. reactions using N-tertiobutyl-1-diethylphosphono-2,2-dimethylpropyl nitroxide (SG1).  
 ST automatic continuous online monitoring polymn ACOMP high viscosity reaction  
 IT Viscosity

(automatic continuous online monitoring of polymn. reactions (ACOMP) adapted to high viscosity reactions)

IT Polymer chains  
(length; automatic continuous online monitoring of polymn. reactions (ACOMP) adapted to high viscosity reactions)

IT Polymerization  
Polymerization catalysts  
(radical; automatic continuous online monitoring of polymn. reactions (ACOMP) adapted to high viscosity reactions)

IT 70833-40-8, Tert-Amyl peroxy 2-ethylhexyl carbonate 188526-94-5, SG1  
RL: CAT (Catalyst use); USES (Uses)  
(automatic continuous online monitoring of polymn. reactions (ACOMP) adapted to high viscosity reactions)

IT 9003-53-6P, Polystyrene 25767-47-9P, Butyl acrylate-styrene copolymer  
RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)  
(automatic continuous online monitoring of polymn. reactions (ACOMP) adapted to high viscosity reactions)

RE.CNT 10 THERE ARE 10 CITED REFERENCES AVAILABLE FOR THIS RECORD

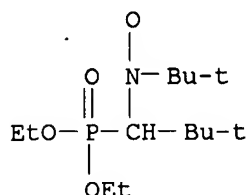
RE

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(2) Anon; ACS Symp Ser 2000, V768  
(3) Catal-Giz, H; Macromolecules 2002, V35, P6557  
(4) Chauvin, F; Macromol Chem Phys 2002, V203(14), P2029 HCAPLUS  
(5) Dotson, N; Polymerization Process Modeling 1996  
(6) Florenzano, F; Macromolecules 1998, V31, P7226 HCAPLUS  
(7) Gillet, J; FR 99/00127 1999  
(8) Mignard, E; in preparation  
(9) Reed, W; Macromolecules 2000, V33, P7165 HCAPLUS  
(10) Tobolsky, A; J Am Chem Soc 1960, V82, P1277 HCAPLUS

IT 188526-94-5, SG1  
RL: CAT (Catalyst use); USES (Uses)  
(automatic continuous online monitoring of polymn. reactions (ACOMP) adapted to high viscosity reactions)

RN 188526-94-5 HCAPLUS

CN Nitroxide, 1-(diethoxyphosphinyl)-2,2-dimethylpropyl 1,1-dimethylethyl (9CI) (CA INDEX NAME)



L32 ANSWER 4 OF 59 HCAPLUS COPYRIGHT 2003 ACS  
AN 2003:188381 HCAPLUS  
DN 138:354320  
TI Controlled Polymerization of Functional Monomers and Synthesis of Block Copolymers Using a .beta.-Phosphonylated Nitroxide  
AU Diaz, T.; Fischer, A.; Jonquieres, A.; Brembilla, A.; Lochon, P.  
CS Equipe de Chimie Physique Organique et Colloiedale Unite Mixte de Recherche CNRS-UHP 7565, Universite Henri Poincare-Nancy 1,

- Vandoeuvre-les-Nancy, 239-54506, Fr.
- SO Macromolecules (2003), 36(7), 2235-2241  
CODEN: MAMOBX; ISSN: 0024-9297
- PB American Chemical Society
- DT Journal
- LA English
- CC 35-4 (Chemistry of Synthetic High Polymers)
- AB 4-Vinylpyridine (4VP) and N,N-dimethylacrylamide (DMAA) were **polymd.** in a controlled manner using a .beta.-phosphonylated nitroxide (N-tert-butyl-N-(1-diethylphosphono-2,2-dimethylpropyl) nitroxide, commonly designated as DEPN) as a control agent. Compared to the results that had previously been reported for the nitroxide-mediated radical **polymn.** (NMRP) with 2,2,6,6-tetramethylpiperidine-1-oxyl (TEMPO), the **polymn.** of 4VP was much faster and very well controlled up to higher monomer conversions. Unlike 4VP, the controlled radical **polymn.** of DMAA using different types of nitroxides had so far remained limited to a very low conversion range (typically inferior to 10%). The use of DEPN gave rise to a very significant improvement of the NMRP of DMAA by providing a good reaction control up to high conversion (approx. 60%). For the first time, the ability of DEPN to control the homopolymn. of DMAA even at high conversion allowed the synthesis of poly(DMAA-b-4VP) block copolymers with a hydrophilic poly(DMAA) block which was longer than the poly(4VP) block. This particular feature should fairly improve the hydro-soly. of the derived amphiphilic cationic polymers, which can be obtained by simple quaternization of the former block copolymers, and extend the scope of their applications.
- ST beta phosphonylated nitroxide catalyst dimethylacrylamide vinylpyridine block copolymer
- IT Polymerization  
(bulk; controlled polymn. of functional monomers and synthesis of block copolymers using a .beta.-phosphonylated nitroxide)
- IT Polyelectrolytes  
(cationic; controlled polymn. of functional monomers and synthesis of block copolymers using a .beta.-phosphonylated nitroxide)
- IT Molecular weight  
Molecular weight distribution  
Quaternization  
(controlled polymn. of functional monomers and synthesis of block copolymers using a .beta.-phosphonylated nitroxide)
- IT Polymerization catalysts  
(radical; controlled polymn. of functional monomers and synthesis of block copolymers using a .beta.-phosphonylated nitroxide)
- IT 188526-94-5P, N-tert-Butyl-(1-diethylphosphono-2,2-dimethylpropyl)Nitroxide  
RL: CAT (Catalyst use); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)  
(controlled polymn. of functional monomers and synthesis of block copolymers using a .beta.-phosphonylated nitroxide)
- IT 111-83-1DP, Octyl bromide, quaternization product with N,N-dimethylacrylamide-4-vinylpyridine block copolymer 112-82-3DP, Hexadecyl bromide, quaternization product with N,N-dimethylacrylamide-4-vinylpyridine block copolymer 143-15-7DP, Dodecyl bromide, quaternization product with N,N-dimethylacrylamide-4-vinylpyridine block copolymer 25232-41-1P, 4-Vinylpyridine homopolymer 26793-34-0P, N,N-Dimethylacrylamide homopolymer 321915-33-7DP, N,N-Dimethylacrylamide-4-vinylpyridine block copolymer, quaternization product with alkyl

bromides

RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)  
 (controlled **polymn.** of functional monomers and synthesis of  
 block copolymers using a .beta.-phosphonylated nitroxide)

IT 2564-83-2, 2,2,6,6-Tetramethylpiperidine-1-oxyl

RL: CAT (Catalyst use); USES (Uses)  
 (for comparison; in controlled polymn. of functional monomers and  
 synthesis of block copolymers using a .beta.-phosphonylated nitroxide)

IT 585-71-7, (1-Bromoethyl)benzene 3030-47-5, Pentamethyldiethylenetriamine  
 227000-10-4

RL: RCT (Reactant); RACT (Reactant or reagent)  
 (in prepn. of catalyst for controlled polymn. of functional monomers  
 and block copolymers)

IT 37222-66-5, Oxone

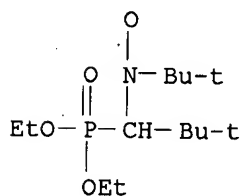
RL: RGT (Reagent); RACT (Reactant or reagent)  
 (in prepn. of catalyst for controlled polymn. of functional monomers  
 and block copolymers)

RE.CNT 43 THERE ARE 43 CITED REFERENCES AVAILABLE FOR THIS RECORD

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 IT 188526-94-5P, N-tert-Butyl-(1-diethylphosphono-2,2-dimethylpropyl)Nitroxide  
 RL: CAT (Catalyst use); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)  
 (controlled polymn. of functional monomers and synthesis of block copolymers using a .beta.-phosphonylated nitroxide)  
 RN 188526-94-5 HCAPLUS  
 CN Nitroxide, 1-(diethoxyphosphinyl)-2,2-dimethylpropyl 1,1-dimethylethyl (9CI) (CA INDEX NAME)



- L32 ANSWER 5 OF 59 HCAPLUS COPYRIGHT 2003 ACS  
 AN 2003:98244 HCAPLUS  
 DN 138:272035  
 TI Preparation of **Polyacrylonitrile**-block-poly(n-butyl acrylate) Copolymers Using Atom Transfer Radical Polymerization and Nitroxide Mediated Polymerization Processes  
 AU Tang, Chuanbing; Kowalewski, Tomasz; Matyjaszewski, Krzysztof  
 CS Center for Macromolecular Engineering Department of Chemistry, Carnegie Mellon University, Pittsburgh, PA, 15213, USA  
 SO Macromolecules (2003), 36(5), 1465-1473  
 CODEN: MAMOBX; ISSN: 0024-9297  
 PB American Chemical Society  
 DT Journal  
 LA English  
 CC 35-4 (Chemistry of Synthetic High Polymers)  
 AB The prepn. of block copolymers with **acrylonitrile** (AN) and Bu **acrylate** (n-BA) was examd. using two controlled radical **polymn.** (CRP) processes: atom transfer radical **polymn.** (ATRP) and nitroxide mediated **polymn.** (NMP). When crossing from poly(Bu **acrylate**) (PBA) to **polymn.** of AN, the use of halogen exchange in an ATRP process improved control of **polymn.** However, when switching from **polyacrylonitrile** (PAN) to n-BA, the cross-propagation was well controlled without halogen exchange. These differences in blocking efficiency can be explained by differences in the



bond dissocn. energy of the terminal carbon-halogen bond. In NMP, an efficient transition from a preformed PBA block to AN **polymn.** required the presence of excess of nitroxide. However, chain-extension from PAN to PBA, even under homogeneous conditions and with an excess nitroxide, was less efficient, and GPC traces showed bimodality.

ST prepn acrylonitrile butyl acrylate block copolymer ATRP radical nitroxide

IT **Polymerization**

(atom transfer, living, radical; prepn. of **acrylonitrile-n-Bu acrylate** block copolymers using ATRP and nitroxide mediated **polymn.** processes)

IT Reactivity ratio in **polymerization**

(prepn. of **acrylonitrile-n-Bu acrylate** block copolymers using ATRP and nitroxide mediated **polymn.** processes)

IT **Polymerization**

(radical, nitroxide mediated; prepn. of **acrylonitrile-n-Bu acrylate** block copolymers using ATRP and nitroxide mediated **polymn.** processes)

IT 188526-94-5, N-tert-Butyl-1-diethylphosphono-2,2-dimethylpropyl nitroxide

RL: CAT (Catalyst use); USES (Uses)

(control agent; prepn. of **acrylonitrile-n-Bu acrylate** block copolymers using ATRP and nitroxide mediated **polymn.** processes)

IT 366-18-7, 2,2'-Bipyridine 3030-47-5

RL: CAT (Catalyst use); USES (Uses)

(ligand; prepn. of **acrylonitrile-n-Bu acrylate** block copolymers using ATRP and nitroxide mediated **polymn.** processes)

IT 78-67-1, Azobis(isobutyronitrile) 5445-17-0, Methyl 2-bromopropionate 7447-39-4, Copper chloride (CuCl<sub>2</sub>), uses 7758-89-6, Copper chloride (CuCl) 7787-70-4, Copper bromide (CuBr) 19481-82-4, 2-Bromopropionitrile

RL: CAT (Catalyst use); USES (Uses)

(prepn. of **acrylonitrile-n-Bu acrylate** block copolymers using ATRP and nitroxide mediated **polymn.** processes)

IT 9003-49-0P, Butyl **acrylate** homopolymer 25014-41-9P, **Acrylonitrile** homopolymer 25567-76-4P, **Acrylonitrile** -butyl **acrylate** copolymer

RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)

(prepn. of **acrylonitrile-n-Bu acrylate** block copolymers using ATRP and nitroxide mediated **polymn.** processes)

IT 137168-27-5P, **Acrylonitrilebutyl acrylate** block copolymer

RL: SPN (Synthetic preparation); PREP (Preparation)

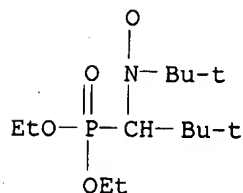
(prepn. of **acrylonitrile-n-Bu acrylate** block copolymers using ATRP and nitroxide mediated **polymn.** processes)

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- IT 188526-94-5, N-tert-Butyl-1-diethylphosphono-2,2-dimethylpropyl nitroxide  
 RL: CAT (Catalyst use); USES (Uses)  
 (control agent; prepn. of acrylonitrile-n-Bu acrylate block copolymers using ATRP and nitroxide mediated polymn. processes)  
 RN 188526-94-5 HCAPLUS  
 CN Nitroxide, 1-(diethoxyphosphinyl)-2,2-dimethylpropyl 1,1-dimethylethyl (9CI) (CA INDEX NAME)

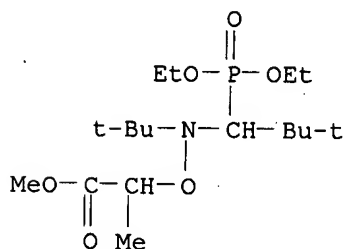


L32 ANSWER 6 OF 59 HCAPLUS COPYRIGHT 2003 ACS  
 AN 2002:932221 HCAPLUS  
 DN 138:170567  
 TI Kinetic study of the nitroxide-mediated controlled free-

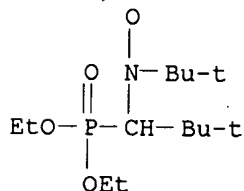
- radical polymerization** of n-butyl acrylate in aqueous miniemulsions
- AU Farcet, Celine; Nicolas, Julien; Charleux, Bernadette
- CS Laboratoire de Chimie Macromoleculaire, Unite Mixte de Recherche 7610, Universite Pierre et Marie Curie, Paris, 75252, Fr.
- SO Journal of Polymer Science, Part A: Polymer Chemistry (2002), 40(24), 4410-4420
- CODEN: JPACEC; ISSN: 0887-624X
- PB John Wiley & Sons, Inc.
- DT Journal
- LA English
- CC 35-3 (Chemistry of Synthetic High Polymers)
- AB The controlled **free-radical** homopolymn. of Bu acrylate was studied in aq. miniemulsions at 112 and 125.degree. with a low molar mass alkoxyamine unimol. **initiator** and an acyclic .beta.-phosphonylated nitroxide mediator, N-tert-butyl-N-(1-diethylphosphono-2,2-dimethylpropyl) nitroxide, also called SG1. The polymns. led to stable latices with 20% solids and were obtained with neither coagulation during synthesis nor destabilization over time. However, in contrast to latices obtained via classical **free-radical polymn.**, the av. particle size of the final latices was large, with broad particle size distributions. The initial [SG1]0/[alkoxyamine]0 molar ratio was shown to control the rate of **polymn.** The fraction of SG1 released upon macroradical self-termination was small with respect to the initial alkoxyamine concn., indicating a very low fraction of dead chains. Av. molar masses were controlled by the initial concn. of alkoxyamine and increased linearly with monomer conversion. The molar mass distribution was narrow, depending on the initial concn. of free nitroxide in the system. The **initiator** efficiency was lower than 1 at 112.degree. but was very significantly improved when either a macroinitiator was used at 112.degree. or the **polymn.** temp. was raised to 125.degree..
- ST butyl acrylate emulsion radical **polymn** kinetics  
nitroxide control; polybutyl acrylate mol wt nitroxide controlled **polymn**
- IT **Polymerization kinetics**  
(emulsion, **radical**; nitroxide-mediated controlled **free-radical polymn.** kinetics of Bu acrylate in aq. miniemulsions)
- IT Molecular weight distribution  
(nitroxide-mediated controlled **free-radical polymn.** kinetics of Bu acrylate in aq. miniemulsions)
- IT 300811-93-2, 3,7-Dioxa-4-aza-6-phosphanonanoic acid, 4,5-bis(1,1-dimethylethyl)-6-ethoxy-2-methyl-, methyl ester, 6-oxide  
RL: CAT (Catalyst use); USES (Uses)  
(**initiator**; nitroxide-mediated controlled **free-radical polymn.** kinetics of Bu acrylate in aq. miniemulsions)
- IT 9003-49-0D, Poly(butyl acrylate), nitroxide-terminated  
RL: CAT (Catalyst use); USES (Uses)  
(macroinitiator; nitroxide-mediated controlled **free-radical polymn.** kinetics of Bu acrylate in aq. miniemulsions)
- IT 188526-94-5, N-tert-Butyl-N-(1-diethylphosphono-2,2-dimethylpropyl)-N-oxyl  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(mediator; nitroxide-mediated controlled **free-radical polymn.** kinetics of Bu acrylate in aq. miniemulsions)

- IT 141-32-2, Butyl **acrylate**  
 RL: PRP (Properties); RCT (Reactant); RACT (Reactant or reagent)  
 (nitroxide-mediated controlled **free-radical**  
**polymn.** kinetics of Bu **acrylate** in aq. miniemulsions)
- IT 9003-49-0P, Poly(butyl **acrylate**)  
 RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)  
 (nitroxide-mediated controlled **free-radical**  
**polymn.** kinetics of Bu **acrylate** in aq. miniemulsions)
- RE.CNT 39 THERE ARE 39 CITED REFERENCES AVAILABLE FOR THIS RECORD  
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- IT 300811-93-2, 3,7-Dioxa-4-aza-6-phosphanonanoic acid,  
 4,5-bis(1,1-dimethylethyl)-6-ethoxy-2-methyl-, methyl ester, 6-oxide  
 RL: CAT (Catalyst use); USES (Uses)  
 (initiator; nitroxide-mediated controlled **free-**  
**radical polymn.** kinetics of Bu **acrylate** in  
 aq. miniemulsions)
- RN 300811-93-2 HCAPLUS  
 CN 3,7-Dioxa-4-aza-6-phosphanonanoic acid, 4,5-bis(1,1-dimethylethyl)-6-

ethoxy-2-methyl-, methyl ester, 6-oxide (9CI) (CA INDEX NAME)



- IT 188526-94-5, N-tert-Butyl-N-(1-diethylphosphono-2,2-dimethylpropyl)-N-oxyl  
 RL: RCT (Reactant); RACT (Reactant or reagent)  
 (mediator; nitroxide-mediated controlled **free-radical** **polymn.** kinetics of Bu **acrylate** in aq. miniemulsions)  
 RN 188526-94-5 HCAPLUS  
 CN Nitroxide, 1-(diethoxyphosphinyl)-2,2-dimethylpropyl 1,1-dimethylethyl  
 (9CI) (CA INDEX NAME)



- L32 ANSWER 7 OF 59 HCAPLUS COPYRIGHT 2003 ACS  
 AN 2002:868644 HCAPLUS  
 DN 138:137668  
 TI Formation of polyacrylate brushes on silica surfaces  
 AU Parvole, J.; Billon, L.; Montfort, J. P.  
 CS Laboratoire de Physico-Chimie des Polymeres, UMR 5067, Pau, 64053, Fr.  
 SO Polymer International (2002), 51(10), 1111-1116  
 CODEN: PLYIEI; ISSN: 0959-8103  
 PB John Wiley & Sons Ltd.  
 DT Journal  
 LA English  
 CC 35-4 (Chemistry of Synthetic High Polymers)  
 AB The formation of **polyacrylate** (molten state polymers; Tg <23.degree.) monolayers attached onto SiO2 surfaces using covalently bonded **initiators** for radical-chain **polymn.** is reported. In a first reaction step, the **initiator** is self-assembled on the surface. In a subsequent reaction, the **initiator** is activated and the polymer formed in situ at the surface of the substrate with high surface grafting d. Also, the use of a living **free-radical** process permits the mol. wt. and polydispersity of the polymer chains to be controlled, and the polymer monolayer thickness also. The polymers have been qual. characterized by x-ray spectroscopy (XPS) and Fourier transformed IR (FTIR) measurements.  
 ST **polyacrylate** surface grafting silica; **acrylate** living

- free radical polymn initiator**
- IT **Polymerization**  
(living, radical; **polyacrylate** brushes grafted on silica surfaces)
- IT **Polymerization kinetics**  
(radical; **polyacrylate** brushes grafted on silica surfaces)
- IT 17170-81-9P  
RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)  
(esterification; polyacrylate brushes grafted on silica surfaces)
- IT 493025-01-7P  
RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)  
(hydrosilation; polyacrylate brushes grafted on silica surfaces)
- IT 493025-02-8P  
RL: CAT (Catalyst use); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)  
(**initiator**, coupling agent; polyacrylate brushes grafted on silica surfaces)
- IT 78-67-1, AIBN  
RL: CAT (Catalyst use); USES (Uses)  
(polyacrylate brushes grafted on silica surfaces)
- IT 2638-94-0 10026-13-8, Phosphorus pentachloride  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(polyacrylate brushes grafted on silica surfaces)
- IT 9003-32-1P, Poly(ethyl acrylate) 9003-49-0P, Poly(butyl acrylate)  
RL: SPN (Synthetic preparation); PREP (Preparation)  
(polyacrylate brushes grafted on silica surfaces)
- IT **188526-94-5 300811-93-2**  
RL: **CAT (Catalyst use)**; USES (Uses)  
(promoter; polyacrylate brushes grafted on silica surfaces)
- IT 107-18-6, Allyl alcohol, reactions 998-30-1, Triethoxysilane  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(reaction with azo compd.; polyacrylate brushes grafted on silica surfaces)
- IT 7631-86-9, Silica, miscellaneous  
RL: MSC (Miscellaneous)  
(substrate, surface grafted; polyacrylate brushes grafted on silica surfaces)

RE.CNT 24 THERE ARE 24 CITED REFERENCES AVAILABLE FOR THIS RECORD

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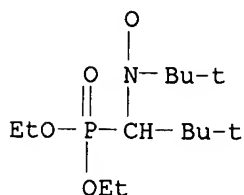
IT 188526-94-5 300811-93-2

RL: CAT (Catalyst use); USES (Uses)

(promoter; polyacrylate brushes grafted on silica surfaces)

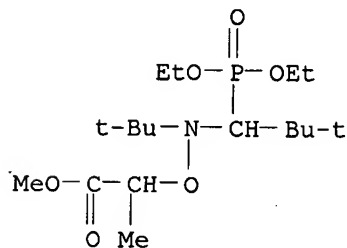
RN 188526-94-5 HCAPLUS

CN Nitroxide, 1-(diethoxyphosphinyl)-2,2-dimethylpropyl 1,1-dimethylethyl  
(9CI) (CA INDEX NAME)



RN 300811-93-2 HCAPLUS

CN 3,7-Dioxa-4-aza-6-phosphanonanoic acid, 4,5-bis(1,1-dimethylethyl)-6-ethoxy-2-methyl-, methyl ester, 6-oxide (9CI) (CA INDEX NAME)



L32 ANSWER 8 OF 59 HCAPLUS COPYRIGHT 2003 ACS

AN 2002:865154 HCAPLUS

DN 138:90137

TI Kinetics and molecular weight evolution during controlled radical polymerization

AU Chauvin, Florence; Alb, Alina M.; Bertin, Denis; Tordo, Paul; Reed, Wayne F.

CS Physics Dept., Tulane University, New Orleans, LA, 70118, USA

SO Macromolecular Chemistry and Physics (2002), 203(14), 2029-2041

CODEN: MCHPES; ISSN: 1022-1352

PB Wiley-VCH Verlag GmbH & Co. KGaA

DT Journal

LA English

CC 35-3 (Chemistry of Synthetic High Polymers)

AB Automatic, continuous online monitoring of **polymn.** reactions (ACOMP) was applied to the controlled radical **polymn.** (CRP) of Bu **acrylate** (BA) using N-tert-butyl-1-diethylphosphono-2,2-

dimethylpropyl nitroxide (SG1), to det. monomer conversion, evolution of mol. wt., reduced viscosity, and rate consts. The conversion is roughly first order, but depends only on the initial ratio of free SG1 to **initiator**; i.e., it is zeroth order in **initiator** concn.

While it was found that the wt.-av. mol. wt. Mw, and viscosity-av. mass increase in approx. linear fashion with conversion, their values are finite at zero conversion. Although ACOMP involves no chromatog. sepn. columns, a useful measure of polydispersity evolution was found from combining Mw and viscosity-based masses. CRP is contrasted with monitoring results for conventional **free-radical**

**polymn.** Distinct light-scattering signatures are expected, and found exptl., for the 2 cases. The CRP kinetic findings allowed the detn. of the equil. const. between active and dormant species at 120.degree. ( $K_{eq} = 1.53 \cdot \text{times. } 10^{-10} \text{ M}$ ), as well as the corresponding kinetic const. of deactivation ( $k_{deact} = 2.8 \cdot \text{times. } 10^7 \text{ L.cntdot.mol}^{-1} \cdot \text{cntdot.s}^{-1}$ ) and activation ( $k_{act} = 4.2 \cdot \text{times. } 10^{-3} \text{ s}^{-1}$ ). Cross-checks on the monitoring results were made with conventional Gel Permeation Chromatog. (GPC), and kinetic behavior was also analyzed in the light of numerical integration software.

- ST radical **polymn** kinetics **polymn** butyl **acrylate**  
mol wt; polybutyl **acrylate** mol wt radical **polymn**
- IT Molecular weight  
(continuous online monitoring of kinetics and mol. wt. evolution during controlled radical **polymn.**)
- IT **Polymerization** kinetics  
(radical; continuous online monitoring of kinetics and mol. wt. evolution during controlled radical **polymn.** of Bu **acrylate**)
- IT 188526-94-5, N-tert-Butyl-1-diethylphosphono-2,2-dimethylpropyl nitroxide  
RL: CAT (Catalyst use); USES (Uses)  
(continuous online monitoring of kinetics and mol. wt. evolution during controlled radical **polymn.** of Bu **acrylate**)
- IT 141-32-2, Butyl **acrylate** 9003-49-0, Poly(butyl **acrylate**)  
RL: PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); RCT (Reactant); PROC (Process); RACT (Reactant or reagent)  
(continuous online monitoring of kinetics and mol. wt. evolution during controlled radical **polymn.** of Bu **acrylate**)

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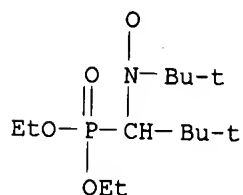
IT 188526-94-5, N-tert-Butyl-1-diethylphosphono-2,2-dimethylpropyl nitroxide

RL: CAT (Catalyst use); USES (Uses)

(continuous online monitoring of kinetics and mol. wt. evolution during controlled radical polymn. of Bu acrylate)

RN 188526-94-5 HCAPLUS

CN Nitroxide, 1-(diethoxyphosphinyl)-2,2-dimethylpropyl 1,1-dimethylethyl (9CI) (CA INDEX NAME)



L32 ANSWER 9 OF 59 HCAPLUS COPYRIGHT 2003 ACS  
 AN 2002:778007 HCAPLUS  
 DN 137:295361  
 TI Polymerization in aqueous suspension of vinyl chloride  
 IN Bonardi, Christian; Couturier, Jean-Luc; Grimaldi, Sandra; Guerret, Olivier; Kervennal, Jacques; Hebrard, Pierre; Taha, Bouchra  
 PA Atofina, Fr.  
 SO PCT Int. Appl., 23 pp.  
 CODEN: PIXXD2  
 DT Patent  
 LA French  
 IC ICM C08F014-06  
 ICS C08F002-18; C08F002-38  
 CC 35-3 (Chemistry of Synthetic High Polymers)  
 FAN.CNT 1

|      | PATENT NO.  | KIND | DATE     | APPLICATION NO. | DATE     |
|------|---|------|----------|-----------------|----------|
| PI   | WO 2002079279   | A1   | 20021010 | WO 2002-FR1094  | 20020328 |
|      | W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM<br>RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG |      |          |                 |          |
|      | FR 2822832  | A1   | 20021004 | FR 2001-4425    | 20010402 |
| PRAI | FR 2001-4425  | A    | 20010402 |                 |          |
| OS   | MARPAT 137:295361   |      |          |                 |          |
| AB   | The invention concerns a method for polymn. in aq. suspension of vinyl chloride alone or mixed with another vinyl monomer, wherein the initiator comprises .gtoreq.1 compd. selected among dialkyl peroxydicarbonates, peroxy-tert-alkanoates and diacyl peroxides, and it consists in using, as terminator of polymn., a stable nitroxyl radical. The resulting resins have good whiteness.  |      |          |                 |          |
| ST   | vinyl chloride radical polymn nitroxyl terminator; peroxy initiator vinyl chloride polymn nitroxyl terminator   |      |          |                 |          |
| IT   | Polymerization catalysts  |      |          |                 |          |
|      | Polymerization inhibitors   |      |          |                 |          |
|      | (radical polymn. in aq. suspension of vinyl chloride in presence of peroxide initiators and nitroxyl radicals as terminators)   |      |          |                 |          |
| IT   | Nitroxides  |      |          |                 |          |
|      | Peroxides, uses   |      |          |                 |          |
|      | RL: CAT (Catalyst use); USES (Uses)   |      |          |                 |          |
|      | (radical polymn. in aq. suspension of vinyl chloride in presence of   |      |          |                 |          |

peroxide initiators and nitroxyl radicals as terminators)

IT 927-07-1, tert-Butyl peroxy-pivalate  
 RL: CAT (Catalyst use); USES (Uses)  
 (Luperox 11M75; radical polymn. in aq. suspension of vinyl chloride in presence of peroxide initiators and nitroxyl radicals as terminators)

IT 16111-62-9, Di-2-ethylhexyl peroxydicarbonate  
 RL: CAT (Catalyst use); USES (Uses)  
 (Luperox 223EN40; radical polymn. in aq. suspension of vinyl chloride in presence of peroxide initiators and nitroxyl radicals as terminators)

IT 105-74-8, Dilauroyl peroxide 2226-96-2, 4-Hydroxy-TEMPO 26748-41-4, Luperox 10M75 95718-78-8, 1,1-Dimethyl-3-hydroxybutyl peroxyneodecanoate 188526-94-5, N-tert-Butyl-1-diethylphosphono-2,2-dimethylpropyl nitroxide  
 RL: CAT (Catalyst use); USES (Uses)  
 (radical polymn. in aq. suspension of vinyl chloride in presence of peroxide **initiators** and nitroxyl radicals as terminators)

IT 9002-86-2P, PVC  
 RL: IMF (Industrial manufacture); PREP (Preparation)  
 (radical polymn. in aq. suspension of vinyl chloride in presence of peroxide initiators and nitroxyl radicals as terminators)

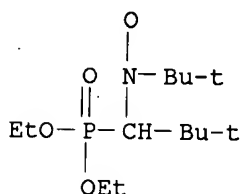
RE.CNT 1 THERE ARE 1 CITED REFERENCES AVAILABLE FOR THIS RECORD  
 RE

(1) Wa; WO 0238632 A 2002 HCAPLUS

IT 188526-94-5, N-tert-Butyl-1-diethylphosphono-2,2-dimethylpropyl nitroxide  
 RL: CAT (Catalyst use); USES (Uses)  
 (radical polymn. in aq. suspension of vinyl chloride in presence of peroxide **initiators** and nitroxyl radicals as terminators)

RN 188526-94-5 HCAPLUS

CN Nitroxide, 1-(diethoxyphosphinyl)-2,2-dimethylpropyl 1,1-dimethylethyl (9CI) (CA INDEX NAME)



L32 ANSWER 10 OF 59 HCAPLUS COPYRIGHT 2003 ACS

AN 2002:717702 HCAPLUS

DN 138:24988

TI Decomposition of model alkoxyamines in simple and polymerizing systems. II. Diastereomeric N-(2-methylpropyl)-N-(1-diethyl-phosphono-2,2-dimethyl-propyl)-aminoxyl-based compounds

AU Ananchenko, Gennady S.; Souaille, Marc; Fischer, Hanns; Le Mercier, Christophe; Tordo, Paul

CS Physikalisch-Chemisches Institut, Universitat Zurich, Zurich, CH 8057, Switz.

SO Journal of Polymer Science, Part A: Polymer Chemistry (2002), 40(19), 3264-3283

CODEN: JPACEC; ISSN: 0887-624X

PB John Wiley & Sons, Inc.

DT Journal  
 LA English  
 CC 35-3 (Chemistry of Synthetic High **Polymers**)  
 AB Thermal reactions of the alkoxyamine diastereomers DEPN-R' [DEPN: N-(2-methylpropyl)-N-(1-diethylphosphono-2,2-dimethyl-propyl)-aminoxyl; R': methoxy-carbonylethyl and phenylethyl] with (R,R) + (S,S) and (R,S) + (S,R) configurations have been investigated by 1H NMR at 100.degree.. During the overall decay the diastereomers interconvert, and an anal. treatment of the combined processes is presented. Rate consts. are obtained for the cleavage and reformation of DEPN-R' from NMR, ESR, and chem. induced dynamic nuclear polarization expts. also using 2,2,6,6-tetramethylpiperidiny1-1-oxyl (TEMPO) as a radical scavenger. The rate consts. depend on the diastereomer configuration and the residues R'. Simulations of the kinetics obsd. with styrene and Me **methacrylate** contg. solns. yielded rate consts. for unimeric and **polymeric** alkoxyamines DEPN-(M)n-R'. The results were compatible with the known DEPN mediation of living styrene and **acrylate** polymns. For Me **methacrylate** the equil. const. of the reversible cleavage of the dormant chains DEPN-(M)n-R' is very large and renders successful living polymns. unlikely. Mechanistic and kinetic differences of DEPN- and TEMPO-mediated polymns. are discussed.

ST alkoxyamine diastereomer decompn living radical polymn **initiator** kinetics NMR  
 IT Decomposition  
 Decomposition kinetics  
 Diastereomers  
 Equilibrium constant  
 (decompn. of diastereomeric N-(2-methylpropyl)-N-(1-di-Et-phosphono-2,2-di-Me-propyl)-aminoxyl-based compds. in simple and polymg. systems)

IT Polymerization catalysts  
 Polymerization kinetics  
 (living, radical; decompn. of diastereomeric N-(2-methylpropyl)-N-(1-di-Et-phosphono-2,2-di-Me-propyl)-aminoxyl-based compds. in simple and polymg. systems)

IT 478185-81-8 478185-82-9 478185-83-0  
 478185-84-1 478185-85-2 478185-86-3  
 478185-87-4 478185-88-5  
 RL: CAT (Catalyst use); CPS (Chemical process); PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process); USES (Uses)  
 (decompn. of diastereomeric N-(2-methylpropyl)-N-(1-di-Et-phosphono-2,2-di-Me-propyl)-aminoxyl-based compds. in simple and polymg. systems)

IT 80-62-6, Methyl **methacrylate** 100-42-5, Styrene, reactions  
 141-32-2, Butyl **acrylate**  
 RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PRP (Properties); RCT (Reactant); PROC (Process); RACT (Reactant or reagent)  
 (decompn. of diastereomeric N-(2-methylpropyl)-N-(1-di-Et-phosphono-2,2-di-Me-propyl)-aminoxyl-based compds. in simple and **polymg.** systems)

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IT 478185-81-8 478185-82-9 478185-83-0  
 478185-84-1 478185-85-2 478185-86-3  
 478185-87-4 478185-88-5

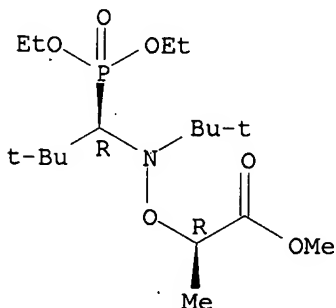
RL: CAT (Catalyst use); CPS (Chemical process); PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process); USES (Uses)

(decompn. of diastereomeric N-(2-methylpropyl)-N-(1-di-Et-phosphono-2,2-di-Me-propyl)-aminoxyl-based compds. in simple and polymg. systems)

RN 478185-81-8 HCAPLUS

CN 3,7-Dioxa-4-aza-6-phosphanonanoic acid, 4,5-bis(1,1-dimethylethyl)-6-ethoxy-2-methyl-, methyl ester, 6-oxide, (2R,5R)- (9CI) (CA INDEX NAME)

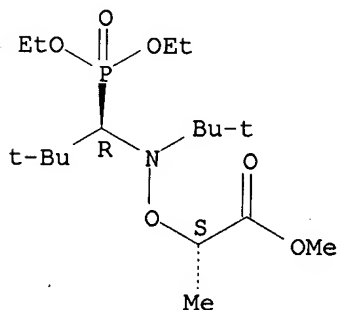
Absolute stereochemistry.



RN 478185-82-9 HCAPLUS

CN 3,7-Dioxa-4-aza-6-phosphanonanoic acid, 4,5-bis(1,1-dimethylethyl)-6-ethoxy-2-methyl-, methyl ester, 6-oxide, (2S,5R)- (9CI) (CA INDEX NAME)

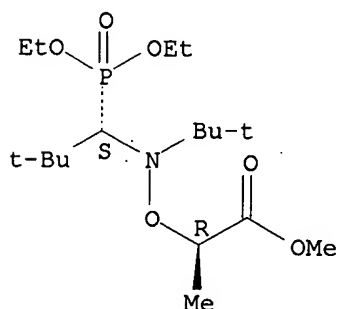
Absolute stereochemistry.



RN 478185-83-0 HCAPLUS

CN 3,7-Dioxa-4-aza-6-phosphanonanoic acid, 4,5-bis(1,1-dimethylethyl)-6-ethoxy-2-methyl-, methyl ester, 6-oxide, (2R,5S)- (9CI) (CA INDEX NAME)

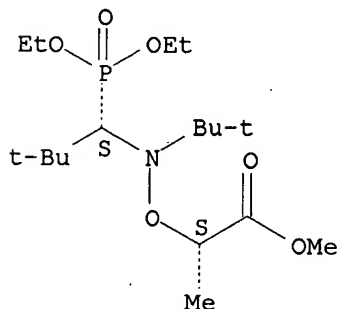
Absolute stereochemistry.



RN 478185-84-1 HCAPLUS

CN 3,7-Dioxa-4-aza-6-phosphanonanoic acid, 4,5-bis(1,1-dimethylethyl)-6-ethoxy-2-methyl-, methyl ester, 6-oxide, (2S,5S)- (9CI). (CA INDEX NAME)

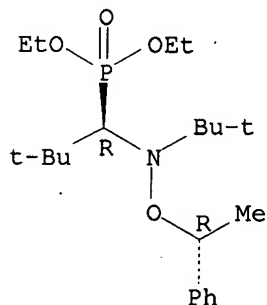
Absolute stereochemistry.



RN 478185-85-2 HCAPLUS

CN Phosphonic acid, [(1R)-1-[(1,1-dimethylethyl)[(1R)-1-phenylethoxy]amino]-2,2-dimethylpropyl]-, diethyl ester (9CI). (CA INDEX NAME)

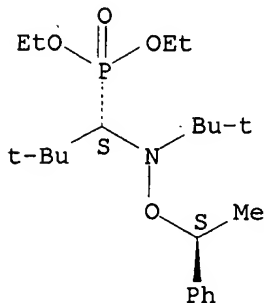
Absolute stereochemistry.



RN 478185-86-3 HCAPLUS

CN Phosphonic acid, [(1S)-1-[(1,1-dimethylethyl)[(1S)-1-phenylethoxy]amino]-2,2-dimethylpropyl]-, diethyl ester (9CI). (CA INDEX NAME)

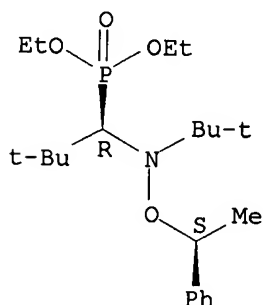
Absolute stereochemistry.



RN 478185-87-4 HCAPLUS

CN Phosphonic acid, [(1R)-1-[(1,1-dimethylethyl)[(1S)-1-phenylethoxy]amino]-2,2-dimethylpropyl]-, diethyl ester (9CI) (CA INDEX NAME)

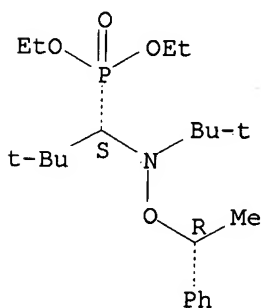
Absolute stereochemistry.



RN 478185-88-5 HCAPLUS

CN Phosphonic acid, [(1S)-1-[(1,1-dimethylethyl)[(1R)-1-phenylethoxy]amino]-2,2-dimethylpropyl]-, diethyl ester (9CI) (CA INDEX NAME)

Absolute stereochemistry.



- L32 ANSWER 11 OF 59 HCAPLUS COPYRIGHT 2003 ACS  
 AN 2002:709890 HCAPLUS  
 DN 137:353388  
 TI Controlled/Living Radical **Polymerization** of tert-Butyl  
**Acrylate** Mediated by Chiral Nitroxides: A Stereochemical Study  
 AU Ananchenko, Gennady; Matyjaszewski, Krzysztof  
 CS Department of Chemistry, Carnegie Mellon University, Pittsburgh, PA,  
 15213, USA  
 SO Macromolecules (2002), 35(22), 8323-8329  
 CODEN: MAMOBX; ISSN: 0024-9297  
 PB American Chemical Society  
 DT Journal  
 LA English  
 CC 35-3 (Chemistry of Synthetic High **Polymers**)  
 AB The two diastereomeric alkoxyamines of tBP-DEPN, where tBP is  
 1-(tert-butoxycarbonyl)ethyl and DEPN is N-(2-methylpropyl)-N-(1-  
 diethylphosphono-2,2-dimethylpropyl)aminoxyl, have marked differences  
 in their thermodyn. stability (ratio of diastereomers is 5:1 at 100.degree.  
 in o-dichlorobenzene). They were used as **initiators** for the



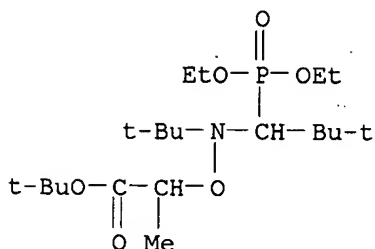
controlled/living radical **polymn.** of tert-Bu **acrylate** to test the premise that such moderators could potentially affect the tacticity of the resulting poly(tert-Bu **acrylate**). 2D NMR was used to analyze the end group configuration for the samples with shorter chain lengths (DP = 15-20). Although the diastereomeric excess in the polymer alkoxyamine end group is even higher than for the model compd. (ratio of diastereomers is 7:1), the distribution of terminal triads in poly(tert-Bu **acrylate**) does not differ from those in the entire chain and is identical to that of the polymers prep'd. by ATRP (atom transfer radical **polymn.**). Thus, the tacticities of the poly(tert-Bu **acrylate**)s prep'd. by DEPN-mediated **polymn.** .. ATRP, and conventional **free radical polymn.** were the same.

- ST butyl **acrylate** controlled living radical **polymn**  
nitroxide **initiator** stereochem; tacticity butyl **acrylate**  
controlled living radical **polymn** nitroxide **initiator**
- IT **Polymerization**  
**Polymerization** catalysts  
(living, radical; prepn. of chiral nitroxide **initiators** and stereochem. study on controlled/living radical **polymn.** of tert-Bu **acrylate** mediated by chiral nitroxides)
- IT Tacticity  
(prepn. of chiral nitroxide **initiators** and stereochem. study on controlled/living radical **polymn.** of tert-Bu **acrylate** mediated by chiral nitroxides)
- IT Decomposition kinetics  
(thermal stability of chiral nitroxide **initiators** and stereochem. study on controlled/living radical **polymn.** of tert-Bu **acrylate** mediated by chiral nitroxides)
- IT 80037-90-7, 1,1,3,3-Tetramethylisoinolindolin-N-oxyl  
RL: CAT (Catalyst use); USES (Uses)  
(**initiator**; prepn. of chiral nitroxide **initiators** and stereochem. study on controlled/living radical **polymn.** of tert-Bu **acrylate** mediated by chiral nitroxides)
- IT 474832-43-4P 474832-44-5P  
RL: CAT (Catalyst use); CPS (Chemical process); PEP (Physical, engineering or chemical process); PRP (Properties); SPN (Synthetic preparation); PREP (Preparation); PROC (Process); USES (Uses)  
(**initiator**; prepn. of chiral nitroxide **initiators** and stereochem. study on controlled/living radical **polymn.** of tert-Bu **acrylate** mediated by chiral nitroxides)
- IT 25232-27-3P, Poly(tert-butyl **acrylate**)  
RL: SPN (Synthetic preparation); PREP (Preparation)  
(prepn. of chiral nitroxide **initiators** and stereochem. study on controlled/living radical **polymn.** of tert-Bu **acrylate** mediated by chiral nitroxides)
- IT 868-73-5 39149-80-9, tert-Butyl 2-bromopropionate 188526-94-5  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(starting material; prepn. of chiral nitroxide **initiators** and stereochem. study on controlled/living radical **polymn.** of tert-Bu **acrylate** mediated by chiral nitroxides)

RE.CNT 41 THERE ARE 41 CITED REFERENCES AVAILABLE FOR THIS RECORD  
RE

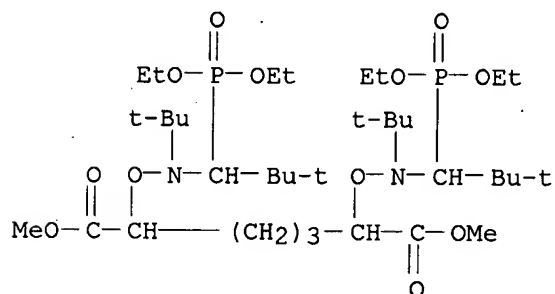
- (1) Ananchenko, G; J Polym Sci, Part A: Polym Chem 2001, V39, P3604 HCAPLUS
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- IT 474832-43-4P 474832-44-5P  
RL: **CAT (Catalyst use)**; CPS (Chemical process); PEP (Physical, engineering or chemical process); PRP (Properties); SPN (Synthetic preparation); PREP (Preparation); PROC (Process); USES (Uses)  
(**initiator**; prepn. of chiral nitroxide **initiators** and stereochem. study on controlled/living radical **polymn.** of tert-Bu **acrylate** mediated by chiral nitroxides)
- RN 474832-43-4 HCAPLUS  
CN 3,7-Dioxa-4-aza-6-phosphanonanoic acid, 4,5-bis(1,1-dimethylethyl)-6-ethoxy-2-methyl-, 1,1-dimethylethyl ester, 6-oxide (9CI) (CA INDEX NAME)



RN 474832-44-5 HCAPLUS

CN Heptanedioic acid, 2,6-bis[[[1-(diethoxyphosphinyl)-2,2-dimethylpropyl](1,1-dimethylethyl)amino]oxy]-, dimethyl ester (9CI) (CA INDEX NAME)



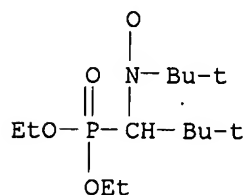
IT 188526-94-5

RL: RCT (Reactant); RACT (Reactant or reagent)

(starting material; prepn. of chiral nitroxide **initiators** and stereochem. study on controlled/living radical **polymn.** of tert-Bu **acrylate** mediated by chiral nitroxides)

RN 188526-94-5 HCAPLUS

CN Nitroxide, 1-(diethoxyphosphinyl)-2,2-dimethylpropyl 1,1-dimethylethyl (9CI) (CA INDEX NAME)



L32 ANSWER 12 OF 59 HCAPLUS COPYRIGHT 2003 ACS

AN 2002:647922 HCAPLUS

DN 138:171878

TI **Acrylic coatings** produced with controlled radical **polymerization** techniques

AU Callais, Peter; Moskal, Michael; Pichai, Puvin; Guerret, Olivier; Charleux, Bernadette

CS ATOFINA Chemicals Organic Peroxides R&D, King of Prussia, PA, 19406, USA

- SO Proceedings of the International Waterborne, High-Solids, and Powder Coatings Symposium (2002), 29th, 197-210  
CODEN: PIWCF4
- PB University of Southern Mississippi, Dep. of Polymer Science
- DT Journal
- LA English
- CC 42-7 (**Coatings, Inks, and Related Products**)  
Section cross-reference(s): 35
- AB **Free radical** polymers. account for more than 50% of the world's polymer prodn. It is difficult to control these polymers. and synthesize tailored mols. with specific architecture and properties. Several techniques have been researched to develop ways to control **free radical** polymers. and terms like controlled radical **polym.** (CRP) or "living" **free radical** polymers. have been used to describe the process. The key aspect in CRP is its ability to eliminate the termination of growing **free radical** chains. This facilitates the synthesis of polymers with low polydispersity, as well as co- and multi-block copolymers. This technol. also allows well-defined polymer modification and grafting. We have developed a family of nitroxide derivs. that can be applied to a wide range of **free radical** polymers. to perform controlled radical polymer synthesis. This paper will examine the use of two nitroxide compds., namely SG-1 and MONAMS, to synthesize **acrylic** high solids **coating** resins with low polydispersity. We will also discuss the prodn. of block copolymers using these nitroxide in a mini-emulsion process. The chem., synthesis techniques, and properties of these **coating** resins will be discussed.
- ST waterborne **coating** nitroxide mol wt distribution  
**acrylate** block copolymer; nitroxide control radical **polym**  
**acrylic coating**
- IT Molecular weight distribution  
Viscosity  
(**acrylic coatings** produced with controlled radical **polym.**)
- IT Polymers, properties  
RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)  
(block; **acrylic coatings** produced with controlled radical **polym.**)
- IT **Polymerization**  
(emulsion; **acrylic coatings** produced with controlled radical **polym.**)
- IT **Polymerization** catalysts  
(living, radical; **acrylic coatings** produced with controlled radical **polym.**)
- IT **Coating** materials  
(water-thinned; **acrylic coatings** produced with controlled radical **polym.**)
- IT 9003-53-6P, Polystyrene 110772-34-4P, **Butylacrylate**-styrene block copolymer  
RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)  
(**acrylic coatings** produced with controlled radical **polym.**)
- IT 355118-27-3P, **Butylacrylate**-butyl methacrylate block copolymer  
RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)  
(diblock; **acrylic coatings** produced with controlled radical **polym.**)
- IT 9003-49-0P, **Butylacrylate** homopolymer

RL: NUU (Other use, unclassified); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)

(latex; **acrylic coatings** produced with controlled radical **polymn.**)

IT 870-98-4, tert.-Amyl peroctoate 188526-94-5 300811-93-2

RL: **CAT (Catalyst use)**; USES (Uses)

(**polymn.** catalyst; **acrylic coatings** produced with controlled radical **polymn.**)

IT 544-76-3, Hexadecane

RL: NUU (Other use, unclassified); USES (Uses)

(surfactant; **acrylic coatings** produced with controlled radical **polymn.**)

RE.CNT 25 THERE ARE 25 CITED REFERENCES AVAILABLE FOR THIS RECORD  
RE

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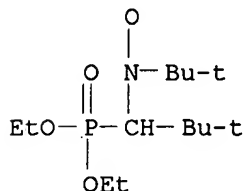
IT 188526-94-5 300811-93-2

RL: **CAT (Catalyst use)**; USES (Uses)

(**polymn.** catalyst; **acrylic coatings** produced with controlled radical **polymn.**)

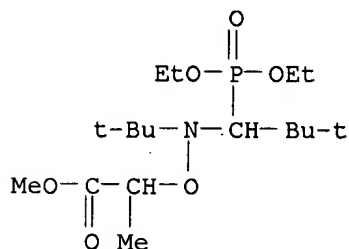
RN 188526-94-5 HCAPLUS

CN Nitroxide, 1-(diethoxyphosphinyl)-2,2-dimethylpropyl 1,1-dimethylethyl (9CI) (CA INDEX NAME)



RN 300811-93-2 HCAPLUS

CN 3,7-Dioxa-4-aza-6-phosphanonanoic acid, 4,5-bis(1,1-dimethylethyl)-6-ethoxy-2-methyl-, methyl ester, 6-oxide (9CI) (CA INDEX NAME)



- L32 ANSWER 13 OF 59 HCAPLUS COPYRIGHT 2003 ACS  
 AN 2002:626641 HCAPLUS  
 DN 137:338197  
 TI Effect of chain transfer to polymer in nitroxide-mediated controlled **free-radical polymerization** of n-butyl **acrylate**  
 AU Farcet, Celine; Belleney, Joel; Charleux, Bernadette  
 CS Lab. Chimie Macromoleculaire, UMR 7610, Univ. Pierre et Marie Curie, Paris, 75252, Fr.  
 SO Polymer Preprints (American Chemical Society, Division of Polymer Chemistry) (2002), 43(2), 299-300  
 CODEN: ACPPAY; ISSN: 0032-3934  
 PB American Chemical Society, Division of Polymer Chemistry  
 DT Journal; (computer optical disk)  
 LA English  
 CC 35-3 (Chemistry of Synthetic High **Polymers**)  
 AB Poly(Bu **acrylate**) with well defined architectures could be prepd. in miniemulsion and in bulk when the radical **polymn.** was mediated by N-tert-butyl-N-[1-(di-Et phosphono)-2,2-dimethylpropyl]nitroxide.  
 ST nitroxide mediated **polymn** butyl **acrylate**  
 IT **Polymerization**  
 (bulk, radical; nitroxide-mediated controlled radical **polymn.** of Bu **acrylate**)  
 IT Chain transfer  
 (in nitroxide-mediated controlled radical **polymn.** of Bu **acrylate**)  
 IT **Polymerization**  
 (microemulsion; nitroxide-mediated controlled radical **polymn.** of Bu **acrylate**)  
 IT **Polymerization** catalysts  
 (radical; nitroxide-mediated controlled radical **polymn.** of Bu **acrylate**)  
 IT 9003-49-0P, Poly(butyl **acrylate**)  
 RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)  
 (from nitroxide-mediated controlled radical **polymn.** of Bu **acrylate**)  
 IT 96-33-3D, Methyl **acrylate**, reaction products with N-tert-Butyl-N-[1-(di-Et phosphono)-2,2-dimethylpropyl]nitroxide  
 188526-94-5 188526-94-5D, reaction products with Me **acrylate**  
 RL: CAT (Catalyst use); USES (Uses)

(nitroxide-mediated controlled radical **polymn.** of Bu  
**acrylate**)

RE.CNT 10 THERE ARE 10 CITED REFERENCES AVAILABLE FOR THIS RECORD  
RE

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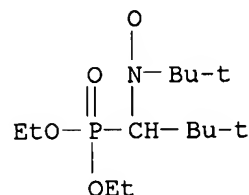
IT 188526-94-5 188526-94-5D, reaction products with Me  
**acrylate**

RL: CAT (Catalyst use); USES (Uses)

(nitroxide-mediated controlled radical **polymn.** of Bu  
**acrylate**)

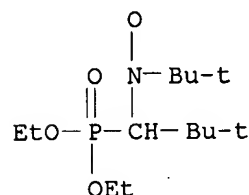
RN 188526-94-5 HCAPLUS

CN Nitroxide, 1-(diethoxyphosphinyl)-2,2-dimethylpropyl 1,1-dimethylethyl  
(9CI) (CA INDEX NAME)



RN 188526-94-5 HCAPLUS

CN Nitroxide, 1-(diethoxyphosphinyl)-2,2-dimethylpropyl 1,1-dimethylethyl  
(9CI) (CA INDEX NAME)



L32 ANSWER 14 OF 59 HCAPLUS COPYRIGHT 2003 ACS

AN 2002:626627 HCAPLUS

DN 137:338267

TI Comparative study of a series of nitroxides and alkoxyamines in  
controlled/"living" radical polymerization

AU Lutz, Jean-Francois; Lacroix-Desmazes, Patrick; Boutevin, Bernard; Le  
Mercier, Christophe; Gimes, Didier; Bertin, Denis; Tordo, Paul

CS Lab. Chimie Macromoleculaire, UMR-CNRS 5076, Ecole Nationale Supérieure  
Chimie Montpellier, Montpellier, 34296, Fr.

SO Polymer Preprints (American Chemical Society, Division of Polymer

Chemistry) (2002), 43(2), 287-288

CODEN: ACPAY; ISSN: 0032-3934

PB American Chemical Society, Division of Polymer Chemistry  
DT Journal; (computer optical disk)

LA English

CC 35-4 (Chemistry of Synthetic High Polymers)

AB Living **polymn.** of styrene was studied with a series of nitroxides and alkoxyamines as the catalysts. **Polymn.** of Bu **acrylate** or vinyl acetate was also studied. It was found that an alkoxyamine based on SGI-OH nitroxide permitted controlled **polymn.** of styrene and Bu **acrylate** at 110.degree. in 3 h. Moreover an alkoxyamine based on DMPN nitroxide, which possesses Me substituents on the phosphorous atom, allows fast and efficient controlled **polymn.** of styrene at 95.degree., and Bu **acrylate** at 90.degree.. Among the nitroxides reported for NMP, DMPN is presently the most active. However, this structure has a pronounced tendency towards self-decompn. nitroxide alkoxyamine mediated living polymn styrene comparison catalyst  
ST Polymerization

(living, radical; comparative study of a series of nitroxides and alkoxyamines in controlled/"living" radical polymn.)

IT Molecular weight

(of polymers prep'd. with a series of nitroxides and alkoxyamines in controlled/"living" radical polymn.)

IT Polymerization kinetics

(radical; comparative study of a series of nitroxides and alkoxyamines in controlled/"living" radical polymn.)

IT Bond cleavage

(rate const.; comparative study of a series of nitroxides and alkoxyamines in controlled/"living" radical polymn.)

IT 224575-62-6 227000-59-1 283600-83-9

283600-84-0 283600-88-4 462104-39-8

462104-40-1

RL: CAT (Catalyst use); USES (Uses)

(catalyst; comparative study of a series of nitroxides and alkoxyamines in controlled/"living" radical polymn.)

IT 9003-20-7P, Vinyl acetate homopolymer 9003-49-0P, Butyl **acrylate** homopolymer 9003-53-6P, Styrene homopolymer

RL: SPN (Synthetic preparation); PREP (Preparation)

(comparative study of a series of nitroxides and alkoxyamines in controlled/"living" radical **polymn.**)

IT 100-42-5, Styrene, reactions 108-05-4, Vinyl acetate, reactions 141-32-2, Butyl **acrylate**

RL: RCT (Reactant); RACT (Reactant or reagent)

(**polymn.** rate using a series of nitroxides and alkoxyamines in controlled/"living" radical **polymn.**)

RE.CNT 14 THERE ARE 14 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE

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IT 224575-62-6 283600-83-9 283600-84-0

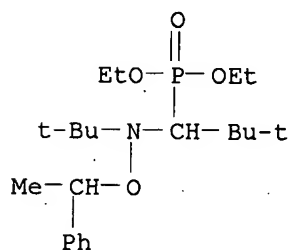
283600-88-4 462104-39-8 462104-40-1

RL: CAT (Catalyst use); USES (Uses)

(catalyst; comparative study of a series of nitroxides and alkoxyamines in controlled/"living" radical polymn.)

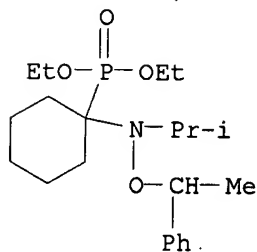
RN 224575-62-6 HCAPLUS

CN Phosphonic acid, [1-[(1,1-dimethylethyl)(1-phenylethoxy)amino]-2,2-dimethylpropyl]-, diethyl ester (9CI) (CA INDEX NAME)



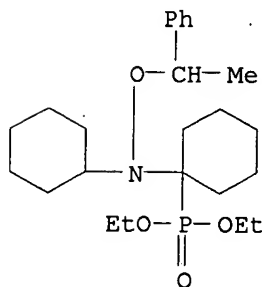
RN 283600-83-9 HCAPLUS

CN Phosphonic acid, [1-[(1-methylethyl)(1-phenylethoxy)amino]cyclohexyl]-, diethyl ester (9CI) (CA INDEX NAME)



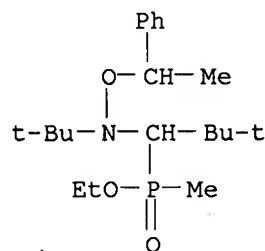
RN 283600-84-0 HCAPLUS

CN Phosphonic acid, [1-[cyclohexyl(1-phenylethoxy)amino]cyclohexyl]-, diethyl ester (9CI) (CA INDEX NAME)



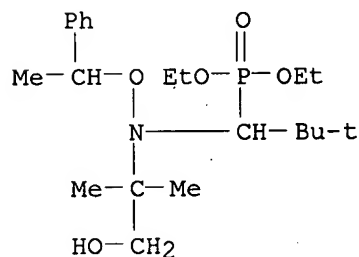
RN 283600-88-4 HCAPLUS

CN Phosphinic acid, [1-[(1,1-dimethylethyl)(1-phenylethoxy)amino]-2,2-dimethylpropyl]methyl-, ethyl ester (9CI) (CA INDEX NAME)



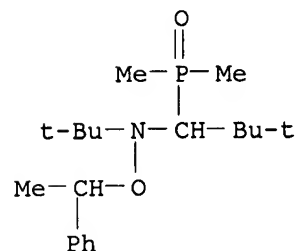
RN 462104-39-8 HCAPLUS

CN Phosphonic acid, [1-[(2-hydroxy-1,1-dimethylethyl)(1-phenylethoxy)amino]-2,2-dimethylpropyl]-, diethyl ester (9CI) (CA INDEX NAME)



RN 462104-40-1 HCAPLUS

CN 1-Propanamine, N-(1,1-dimethylethyl)-1-(dimethylphosphinyl)-2,2-dimethyl-N-(1-phenylethoxy)- (9CI) (CA INDEX NAME)



L32 ANSWER 15 OF 59 HCAPLUS COPYRIGHT 2003 ACS

AN 2002:626624 HCAPLUS

DN 137:338266

TI Synthesis of fluorinated block copolymers by nitroxide-mediated radical polymerization for supercritical carbon dioxide applications

AU Lacroix-Desmazes, Patrick; Boutevin, Bernard; Taylor, Darlene K.; DeSimone, Joseph M.

CS Lab. Chimie Macromoleculaire, UMR-CNRS 5076, Ecole Nationale Supérieure Chimie Montpellier, Montpellier, 34296, Fr.

SO Polymer Preprints (American Chemical Society, Division of Polymer

Chemistry) (2002), 43(2), 285-286

CODEN: ACPPAY; ISSN: 0032-3934

PB American Chemical Society, Division of Polymer Chemistry

DT Journal; (computer optical disk)

LA English

CC 35-4 (Chemistry of Synthetic High **Polymers**)

AB Well-defined side-chain liq.-cryst. fluorinated block copolymers poly(styrene)-b-poly(perfluorooctyl-ethylenoxymethylstyrene) (PS-b-PFDS) and poly(styrene)-b-poly(1,1,2,2-tetrahydroperfluorodecyl **acrylate**) (PS-b-PFDA) were successfully synthesized by nitroxide-mediated radical **polymn.** The living nature of the **polymn.** was confirmed by size exclusion chromatog. and proton NMR analyses in .alpha.,.alpha.,.alpha.-trifluorotoluene. The fluorinated CO<sub>2</sub>-philic block, if large enough, imparts soly. to the diblock copolymers in liq. and supercrit. carbon dioxide, making them useful as macromol. surfactants in this environmentally benign medium.

ST styrene block copolymer prepn nitroxide radical **polymn**;  
perfluorooctylethylenoxymethylstyrene block copolymer prepn nitroxide radical **polymn**

IT Cloud point

(prepn. of fluorinated block copolymers by nitroxide-mediated radical **polymn.** for supercrit. carbon dioxide applications)

IT Fluoropolymers, preparation

RL: PRP (Properties); SPN (Synthetic preparation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)

(prepn. of fluorinated block copolymers by nitroxide-mediated radical **polymn.** for supercrit. carbon dioxide applications)

IT Polymerization catalysts

(radical; prepn. of fluorinated block copolymers by nitroxide-mediated radical **polymn.** for supercrit. carbon dioxide applications)

IT 125953-40-4P, 1,1,2,2-Tetrahydroperfluorodecyl **acrylate**-styrene block copolymer 474067-53-3P, Perfluorooctyl-ethylenoxymethylstyrene-styrene block copolymer

RL: PRP (Properties); SPN (Synthetic preparation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)

(diblock; prepn. of fluorinated block copolymers by nitroxide-mediated radical **polymn.** for supercrit. carbon dioxide applications)

IT 9003-53-6P, Polystyrene

RL: SPN (Synthetic preparation); PREP (Preparation)

(precursors; prepn. of fluorinated block copolymers by nitroxide-mediated radical **polymn.** for supercrit. carbon dioxide applications)

IT 2564-83-2, TEMPO **188526-94-5**, N-tert-Butyl-1-diethylphosphono-2,2-dimethylpropyl nitroxide

RL: **CAT (Catalyst use)**; USES (Uses)

(prepn. of fluorinated block copolymers by nitroxide-mediated radical **polymn.** for supercrit. carbon dioxide applications)

RE.CNT 17 THERE ARE 17 CITED REFERENCES AVAILABLE FOR THIS RECORD

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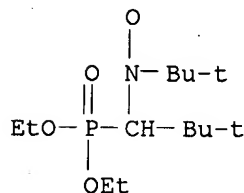
IT 188526-94-5, N-tert-Butyl-1-diethylphosphono-2,2-dimethylpropyl nitroxide

RL: CAT (Catalyst use); USES (Uses)

(prepn. of fluorinated block copolymers by nitroxide-mediated radical polymn. for supercrit. carbon dioxide applications)

RN 188526-94-5 HCAPLUS

CN Nitroxide, 1-(diethoxyphosphinyl)-2,2-dimethylpropyl 1,1-dimethylethyl (9CI) (CA INDEX NAME)



L32 ANSWER 16 OF 59 HCAPLUS COPYRIGHT 2003 ACS

AN 2002:626589 HCAPLUS

DN 137:338364

TI Coupling of .omega.-alkoxyamine polymers with the aid of .alpha.-methylstyrene

AU Chevalier, C.; Guerret, O.; Gnanou, Y.

CS Lab. Chimie Polymeres Organiques, UMR 5629, ENSCPB-CNRS Univ. Bordeaux 1, Pessac, 33607, Fr.

SO Polymer Preprints (American Chemical Society, Division of Polymer Chemistry) (2002), 43(2), 253-254  
CODEN: ACPPAY; ISSN: 0032-3934

PB American Chemical Society, Division of Polymer Chemistry

DT Journal; (computer optical disk)

LA English

CC 35-8 (Chemistry of Synthetic High Polymers)

AB This contribution presented preliminary results concerning the coupling/dimerization of .omega.-alkoxyamine-polymers in the presence of .alpha.-Me styrene. It was found for .omega.-alkoxyamine-polystyrene that the coupling/dimerization of these chains could reach efficiency values as high as 0.9 when heating them in neat .alpha.-Me styrene, above the ceiling temp. of this .alpha.-substituted monomer.

ST polystyrene alkoxyamine coupling reaction mechanism

IT Coupling reaction

Dimerization

Polymerization catalysts  
(coupling of .omega.-alkoxyamine polymers with the aid of .alpha.-methylstyrene)

IT 98-83-9DP, .alpha.-Methylstyrene, reaction products with polystyrene  
9003-53-6DP, Polystyrene, alkoxyamine-terminated, reaction products with methylstyrene  
RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)  
(coupling of .omega.-alkoxyamine polymers with the aid of .alpha.-methylstyrene)

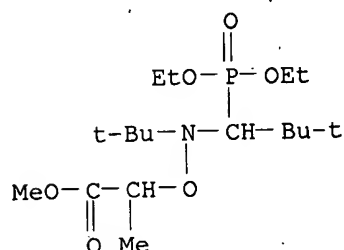
IT 300811-93-2  
RL: CAT (Catalyst use); USES (Uses)  
(initiator; coupling of .omega.-alkoxyamine polymers with the aid of .alpha.-methylstyrene)

RE.CNT 13 THERE ARE 13 CITED REFERENCES AVAILABLE FOR THIS RECORD  
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IT 300811-93-2  
RL: CAT (Catalyst use); USES (Uses)  
(initiator; coupling of .omega.-alkoxyamine polymers with the aid of .alpha.-methylstyrene)

RN 300811-93-2 HCAPLUS  
CN 3,7-Dioxa-4-aza-6-phosphanonanoic acid, 4,5-bis(1,1-dimethylethyl)-6-ethoxy-2-methyl-, methyl ester, 6-oxide (9CI) (CA INDEX NAME)



L32 ANSWER 17 OF 59 HCAPLUS COPYRIGHT 2003 ACS  
AN 2002:624979 HCAPLUS  
DN 137:353473  
TI Role of nitroxides in the elaboration of new organic materials  
AU Chauvin, F.; Gimes, D.; Marque, S.; Bertin, D.; Tordo, P.; Guerret, O.  
CS UMR 6517 case 521, CNRS, Univ. Aix-marseille, Marseille, 13397, Fr.  
SO Polymer Preprints (American Chemical Society, Division of Polymer Chemistry) (2002), 43(2), 108-109

CODEN: ACPPAY; ISSN: 0032-3934

PB American Chemical Society, Division of Polymer Chemistry

DT Journal; (computer optical disk)

LA English

CC 35-8 (Chemistry of Synthetic High **Polymers**)

AB Nitroxides are one of the most efficient and universal controllers of radical reaction involved in synthesis of org. materials. These stable **free radicals** allow to increase physico-chem. properties of various polymers from commodity polymers to nanostructured materials. One of the advantages is the capacity of using such mols. during the processing of polymers in extruders. Different nitroxides were used as **polymn. catalysts** and polymer degrdn. catalysts.

ST nitroxide controller radical reaction polymn catalyst degrdn

IT Impact strength

Polymerization catalysts

(nitroxides used as universal controllers of radical reaction including polymn. catalysts and polymer degrdn. catalysts)

IT Nitroxides

RL: CAT (Catalyst use); USES (Uses)

(nitroxides used as universal controllers of radical reaction including polymn. catalysts and polymer degrdn. catalysts)

IT Linear low density polyethylenes

RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)

(nitroxides used as universal controllers of radical reaction including polymn. catalysts and polymer degrdn. catalysts)

IT Polymer degradation

(oxidative; nitroxides used as universal controllers of radical reaction including polymn. catalysts and polymer degrdn. catalysts)

IT Polyamines

RL: RCT (Reactant); RACT (Reactant or reagent)

(oxidized; nitroxides used as universal controllers of radical reaction including polymn. catalysts and polymer degrdn. catalysts)

IT Polymer morphology

(phase; nitroxides used as universal controllers of radical reaction including polymn. catalysts and polymer degrdn. catalysts)

IT 74-85-1D, Ethene, polymers with .alpha.-olefins

RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)

(linear low-d.; nitroxides used as universal controllers of radical reaction including polymn. catalysts and polymer degrdn. catalysts)

IT 2564-83-2, TEMPO **188526-94-5 300811-93-2**

RL: **CAT (Catalyst use)**; USES (Uses)

(nitroxides used as universal controllers of radical reaction including polymn. catalysts and polymer degrdn. catalysts)

IT 9002-88-4, HDPE

RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)

(nitroxides used as universal controllers of radical reaction including polymn. catalysts and polymer degrdn. catalysts)

IT 9003-07-0, Polypropylene

RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process)

(nitroxides used as universal controllers of radical reaction including polymn. catalysts and polymer degrdn. catalysts)

IT 108501-18-4P, n-Butyl **acrylate-methyl methacrylate** block copolymer

RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)

(nitroxides used as universal controllers of radical reaction including polymn. catalysts and polymer degrdn. catalysts)

IT 110-05-4, Di-tert-butyl peroxide  
 RL: RCT (Reactant); RACT (Reactant or reagent)  
 (oxidant; nitroxides used as universal controllers of radical reaction including polymn. catalysts and polymer degrdn. catalysts)

IT 71878-19-8D, Chimassorb 944, oxidized  
 RL: RCT (Reactant); RACT (Reactant or reagent)  
 (polynitroxide; nitroxides used as universal controllers of radical reaction including polymn. catalysts and polymer degrdn. catalysts)

RE.CNT 13 THERE ARE 13 CITED REFERENCES AVAILABLE FOR THIS RECORD

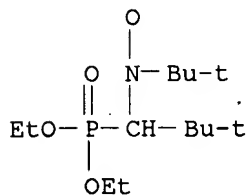
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IT 188526-94-5 300811-93-2  
 RL: CAT (Catalyst use); USES (Uses)  
 (nitroxides used as universal controllers of radical reaction including polymn. catalysts and polymer degrdn. catalysts)

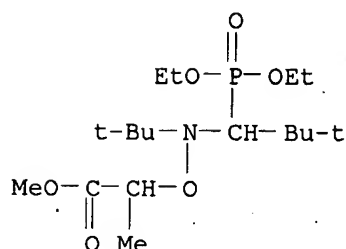
RN 188526-94-5 HCAPLUS

CN Nitroxide, 1-(diethoxyphosphinyl)-2,2-dimethylpropyl 1,1-dimethylethyl  
 (9CI) (CA INDEX NAME)



RN 300811-93-2 HCAPLUS

CN 3,7-Dioxa-4-aza-6-phosphanonanoic acid, 4,5-bis(1,1-dimethylethyl)-6-ethoxy-2-methyl-, methyl ester, 6-oxide (9CI) (CA INDEX NAME)



- L32 ANSWER 18 OF 59 HCAPLUS COPYRIGHT 2003 ACS  
 AN 2002:624966 HCAPLUS  
 DN 137:353359  
 TI Use of a difunctional alkoxyamine **initiator** in the miniemulsion  
**polymerization** of n-butyl **acrylate**  
 AU Farcet, Celine; Charleux, Bernadette; Pirri, Rosangela; Guerret, Olivier  
 CS Lab. Chimie Macromoleculaire, UMR 760, Univ. Pierre et Marie Curie, Paris,  
 75252, Fr.  
 SO Polymer Preprints (American Chemical Society, Division of Polymer  
 Chemistry) (2002), 43(2), 98-99  
 CODEN: ACPPAY; ISSN: 0032-3934  
 PB American Chemical Society, Division of Polymer Chemistry  
 DT Journal; (computer optical disk)  
 LA English  
 CC 35-3 (Chemistry of Synthetic High **Polymers**)  
 AB The application of controlled **free-radical**  
**polymn.** to aq. dispersed systems offers the opportunity to  
 directly prep. well-defined copolymers in a latex form. In the presented  
 work a SGI-based difunctional alkoxyamine was used as an **initiator**  
 for the homopolymn. of Bu **acrylate** in aq. miniemulsion, first to  
 increase the achievable molar mass and second, to use the polymer as a  
 difunctional macroinitiator for the synthesis of triblock copolymers in  
 aq. dispersed systems. Well-defined polymers with one alkoxyamine  
 functionality at each end were obtained, providing that monomer conversion  
 was kept below 70%. Beyond this conversion, extensive broadening of the  
 molar mass distribution was evidenced, as the consequence of termination  
 and transfer to polymer. These .alpha.,.omega.-difunctional homopolymers  
 were used as precursors for the synthesis of triblock copolymers.  
 ST alkoxyamine difunctional catalyst miniemulsion **polymn** butyl  
**acrylate**  
 IT **Polymerization** catalysts  
 (difunctional alkoxyamine **initiator** in miniemulsion  
**polymn.** of Bu **acrylate**)  
 IT 188526-94-5  
 RL: CAT (Catalyst use); USES (Uses)  
 (cocatalyst; difunctional alkoxyamine **initiator** in  
 miniemulsion **polymn.** of Bu **acrylate**)  
 IT 300811-94-3  
 RL: CAT (Catalyst use); USES (Uses)  
 (difunctional alkoxyamine **initiator** in miniemulsion  
**polymn.** of Bu **acrylate**)  
 IT 9003-49-0P, Poly(butyl **acrylate**)  
 RL: SPN (Synthetic preparation); PREP (Preparation)  
 (difunctional alkoxyamine **initiator** in miniemulsion  
**polymn.** of Bu **acrylate**)



RE.CNT 18 THERE ARE 18 CITED REFERENCES AVAILABLE FOR THIS RECORD  
RE

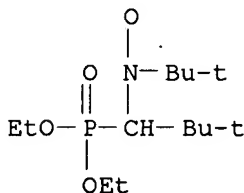
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IT 188526-94-5

RL: **CAT (Catalyst use); USES (Uses)**  
(cocatalyst; difunctional alkoxyamine **initiator** in  
miniemulsion **polymn.** of Bu **acrylate**)

RN 188526-94-5 HCAPLUS

CN Nitroxide, 1-(diethoxyphosphinyl)-2,2-dimethylpropyl 1,1-dimethylethyl  
(9CI) (CA INDEX NAME)

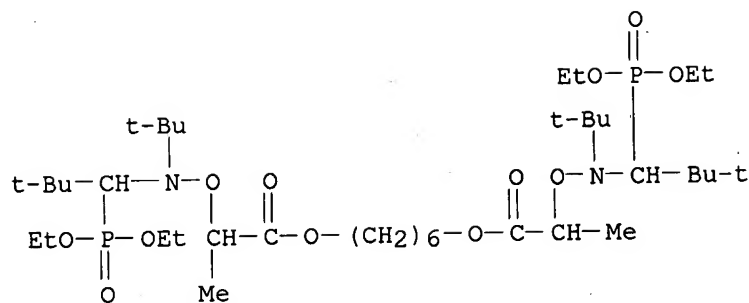


IT 300811-94-3

RL: **CAT (Catalyst use); USES (Uses)**  
(difunctional alkoxyamine **initiator** in miniemulsion  
**polymn.** of Bu **acrylate**)

RN 300811-94-3 HCAPLUS

CN 3,7-Dioxa-4-aza-6-phosphanonanoic acid, 4,5-bis(1,1-dimethylethyl)-6-ethoxy-2-methyl-, 1,6-hexanediyl ester, 6,6'-dioxide (9CI) (CA INDEX NAME)



L32 ANSWER 19 OF 59 HCAPLUS COPYRIGHT 2003 ACS

AN 2002:597366 HCAPLUS

DN 138:155056

TI **Coatings** by controlled radical polymerization

AU Callais, Peter; Guerret, Olivier

CS USA

SO European Coatings Journal (2002), (7-8), 16, 18, 21-22, 24-25

CODEN: ECJOEF; ISSN: 0930-3847

PB Vincentz Verlag

DT Journal

LA English

CC 42-7 (**Coatings, Inks, and Related Products**)

Section cross-reference(s): 35

AB Several techniques have been researched to develop ways to control **free radical** polymns. and terms like "Controlled Radical Polymn." (CRP) or "living" **free radical** polymns. have been used to describe the process. The key aspect in CRP is its ability to eliminate the termination of growing **free radical** chains. This facilitates the synthesis of polymers with low polydispersities, as well as co- and multi-block copolymers. This technol. also allows well-defined polymer modification and grafting. Now, there is a family of nitroxide derivs. that can be applied to a wide range of **free radical** polymns. to perform controlled radical polymer synthesis. This paper will examine the use of two nitroxide compds., namely SG-1 and Monams, to synthesize **acrylic** High Solids **Coating** (HSC) resins with low polydispersities.

ST nitroxide controlled radical **polymn acrylic coating**

IT Nitroxides

RL: CAT (Catalyst use); USES (Uses)

(**polymn.** catalysts; use of nitroxide compds. in controlled radical **polymn.** for prepn. of **acrylic coatings**)

IT **Coating materials**

**Polymerization**

**Polymerization catalysts**

(use of nitroxide compds. in controlled radical **polymn.** for prepn. of **acrylic coatings**)

IT 188526-94-5D, alkoxyamine derivs.

RL: CAT (Catalyst use); USES (Uses)

(Monams; use of nitroxide compds. in controlled radical **polymn.** for prepn. of **acrylic coatings**)

IT 188526-94-5, SG 1

RL: CAT (Catalyst use); USES (Uses)

(SG 1 (**initiator**); use of nitroxide compds. in controlled radical **polymn.** for prepn. of **acrylic coatings**).

IT 110772-34-4P, Butyl **acrylate**-styrene block copolymer  
136456-42-3P, Butyl **methacrylate**-butyl **acrylate**-styrene block copolymer

RL: SPN (Synthetic preparation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)

(use of nitroxide compds. in controlled radical **polymn.** for prepn. of **acrylic coatings**)

RE.CNT 26 THERE ARE 26 CITED REFERENCES AVAILABLE FOR THIS RECORD

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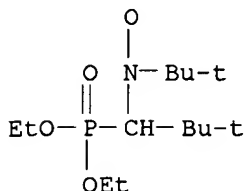
IT 188526-94-5D, alkoxyamine derivs.

RL: **CAT (Catalyst use)**; USES (Uses)

(Monams; use of nitroxide compds. in controlled radical **polymn.** for prepn. of **acrylic coatings**)

RN 188526-94-5 HCAPLUS

CN Nitroxide, 1-(diethoxyphosphinyl)-2,2-dimethylpropyl 1,1-dimethylethyl (9CI) (CA INDEX NAME)



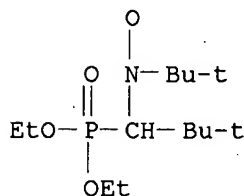
IT 188526-94-5, SG 1

RL: CAT (Catalyst use); USES (Uses)

(SG 1 (initiator); use of nitroxide compds. in controlled radical polymn. for prepn. of acrylic coatings)

RN 188526-94-5 HCAPLUS

CN Nitroxide, 1-(diethoxyphosphinyl)-2,2-dimethylpropyl 1,1-dimethylethyl (9CI) (CA INDEX NAME)



L32 ANSWER 20 OF 59 HCAPLUS COPYRIGHT 2003 ACS

AN 2002:540898 HCAPLUS

DN 137:247987

TI Nitroxide-mediated miniemulsion **polymerization** of n-butyl **acrylate**: synthesis of controlled homopolymers and gradient copolymers with styrene

AU Farcet, Celine; Charleux, Bernadette; Pirri, Rosangela

CS Laboratoire de Chimie Macromoleculaire Unite Mixte de Recherche associee au CNRS (UMR 7610) Universite Pierre et Marie Curie, Paris, 75252, Fr.

SO Macromolecular Symposia (2002), 182(3rd IUPAC-Sponsored International Symposium on Free-Radical Polymerization: Kinetics and Mechanism, 2001), 249-260

CODEN: MSYMEC; ISSN: 1022-1360

PB Wiley-VCH Verlag GmbH

DT Journal

LA English

CC 35-3 (Chemistry of Synthetic High **Polymers**)AB Controlled **free-radical** homopolymn. of Bu

**acrylate** and its copolymn. with styrene have been studied in aq. miniemulsion, using an acyclic .beta.-phosphonylated nitroxide as a mediator, the N-tert-butyl-N-(1-diethylphosphono-2,2-dimethylpropyl) nitroxide, also called SG1. **Polymn.** kinetics have been studied and characterization of the (co)polymers has been performed, demonstrating the successful synthesis of well-defined poly(Bu **acrylate**) homopolymers and poly(Bu **acrylate**-co-styrene) gradient copolymers.

ST nitroxide mediated miniemulsion **polymn** butyl **acrylate**; styrene butyl **acrylate** gradient copolymer prepnIT **Polymerization** kinetics

(emulsion; kinetics of miniemulsion **polymn.** of Bu **acrylate** and styrene in presence of nitroxide deriv. and alkoxyamine **initiator**)

IT **Polymerization** catalysts

(emulsion; prepn. of controlled Bu **acrylate** homopolymer and gradient copolymer with styrene by miniemulsion **polymn.** in presence of nitroxide deriv. and alkoxyamine **initiator**)

IT 83310-58-1

RL: NUU (Other use, unclassified); USES (Uses)

- (Forafac, surfactants; prepn. of controlled Bu **acrylate** homopolymer and gradient copolymer with styrene by miniemulsion **polymn.** in presence of nitroxide deriv. and alkoxyamine **initiator**)
- IT 100-42-5, Styrene, reactions 141-32-2, Butyl **acrylate**  
 RL: PRP (Properties); RCT (Reactant); RACT (Reactant or reagent)  
 (kinetics of miniemulsion **polymn.** of Bu **acrylate** and styrene in presence of nitroxide deriv. and alkoxyamine **initiator**)
- IT 188526-94-5  
 RL: CAT (Catalyst use); USES (Uses)  
 (prepn. of controlled Bu **acrylate** homopolymer and gradient copolymer with styrene by miniemulsion **polymn.** in presence of nitroxide deriv. and alkoxyamine **initiator**)
- IT 9003-49-0P, Poly(butyl **acrylate**) 25767-47-9P, Butyl **acrylate**-styrene copolymer  
 RL: SPN (Synthetic preparation); PREP (Preparation)  
 (prepn. of controlled Bu **acrylate** homopolymer and gradient copolymer with styrene by miniemulsion **polymn.** in presence of nitroxide deriv. and alkoxyamine **initiator**)
- IT 151-21-3, Sodium dodecyl sulfate, uses 157710-33-3, Dowfax 8390  
 RL: NUU (Other use, unclassified); USES (Uses)  
 (surfactants; prepn. of controlled Bu **acrylate** homopolymer and gradient copolymer with styrene by miniemulsion **polymn.** in presence of nitroxide deriv. and alkoxyamine **initiator**)
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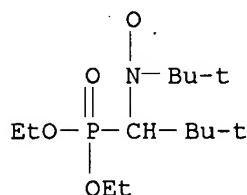
IT 188526-94-5

RL: CAT (Catalyst use); USES (Uses)

(prepn. of controlled Bu **acrylate** homopolymer and gradient copolymer with styrene by miniemulsion **polymn.** in presence of nitroxide deriv. and alkoxyamine **initiator**)

RN 188526-94-5 HCAPLUS

CN Nitroxide, 1-(diethoxyphosphinyl)-2,2-dimethylpropyl 1,1-dimethylethyl (9CI) (CA INDEX NAME)



L32 ANSWER 21 OF 59 HCAPLUS COPYRIGHT 2003 ACS

AN 2002:540897 HCAPLUS

DN 137:263340

TI Design and use of .beta.-phosphorus nitroxides and alkoxyamines in controlled/"living" **free radical polymerizations**

AU Le Mercier, Christophe; Acerbis, Sebastien; Bertin, Denis; Chauvin, Florence; Gimes, Didier; Guerret, Olivier; Lansalot, Muriel; Marque, Sylvain; Le Moigne, Francois; Fischer, Hanns; Tordo, Paul

CS Aix-Marseille 1 and 3 Universities and CNRS, UMR 6517 "Chemistry, Biology and Free Radicals", Marseille, 13397, Fr.

SO Macromolecular Symposia (2002), 182(3rd IUPAC-Sponsored International Symposium on Free-Radical Polymerization: Kinetics and Mechanism, 2001), 225-247

CODEN: MSYMEC; ISSN: 1022-1360

PB Wiley-VCH Verlag GmbH

DT Journal

LA English

CC 35-3 (Chemistry of Synthetic High **Polymers**)

AB Persistent nitroxides and their corresponding alkoxyamines are important regulators of living radical **polymn.** Here we describe the synthesis of .beta.-phosphorus nitroxides bearing a .beta.-hydrogen, that

present very interesting properties for the control of the radical **polymn.** of styrenes, **acrylates** and other monomers. A large series of alkoxyamines derived from these nitroxides was prep'd., and ESR (ESR) was used to det. both the temp. (Tc) and the rate const. (kd) for their homolysis. For the whole series of alkoxyamines (27 compds.), a very good linear correlation was found between Tc and logkd. Satisfactory linear correlations were found between Tc and calcd. (PM3 method) Bond Dissocn. Energy (BDE) of the NO-C bond, for series of alkoxyamines with the same type of leaving radical. The characteristics of **free radical polymn.** of styrene carried out in the presence of these new nitroxides and alkoxyamines will be discussed.

ST phosphorus nitroxide alkoxyamine living radical polymn catalyst  
IT Polymerization catalysts

(living, radical; .beta.-phosphorus nitroxides and alkoxyamines in controlled/living radical polymn.)

IT 34672-81-6 54051-40-0 54051-41-1 102261-92-7 154554-67-3  
157462-14-1 197246-27-8 224575-61-5 224575-62-6  
227000-59-1 258354-78-8 283600-81-7 283600-82-8  
283600-88-4 288583-07-3 288583-09-5  
288583-10-8 300811-93-2 462104-37-6  
462104-38-7 462104-39-8 462104-40-1  
462104-41-2 462104-42-3 462104-43-4  
462104-44-5 462104-45-6

RL: CAT (Catalyst use); PRP (Properties); USES (Uses)

(.beta.-phosphorus nitroxides and alkoxyamines in controlled/living radical polymn.)

IT 188526-94-5P 188707-72-4P 258354-63-1P  
258354-64-2P 263355-91-5P 339127-95-6P  
462104-32-1P 462104-33-2P 462104-34-3P  
462104-35-4P 462104-36-5P

RL: CAT (Catalyst use); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)

(.beta.-phosphorus nitroxides and alkoxyamines in controlled/living radical polymn.)

IT 9003-53-6P, Polystyrene

RL: SPN (Synthetic preparation); PREP (Preparation)

(.beta.-phosphorus nitroxides and alkoxyamines in controlled/living radical polymn.)

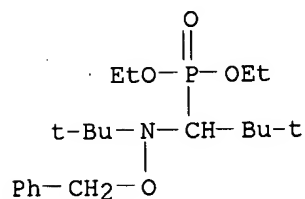
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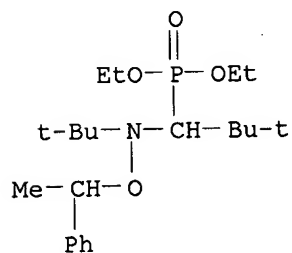
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- IT 224575-61-5 224575-62-6 258354-78-8  
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288583-10-8 300811-93-2 462104-37-6  
462104-38-7 462104-39-8 462104-40-1  
462104-41-2 462104-42-3 462104-43-4  
462104-44-5
- RL: CAT (Catalyst use); PRP (Properties); USES (Uses)  
(.beta.-phosphorus nitroxides and alkoxyamines in controlled/living  
radical polymn.)
- RN 224575-61-5 HCAPLUS
- CN Phosphonic acid, [1-[(1,1-dimethylethyl)(phenylmethoxy)amino]-2,2-  
dimethylpropyl]-, diethyl ester (9CI) (CA INDEX NAME)





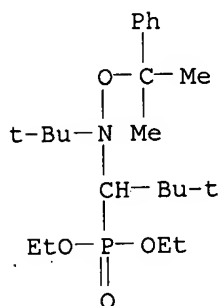
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CN Phosphonic acid, [1-[(1,1-dimethylethyl)(1-phenylethoxy)amino]-2,2-dimethylpropyl]-, diethyl ester (9CI) (CA INDEX NAME)



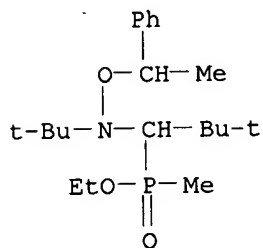
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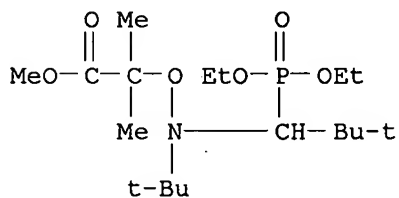
RN 283600-88-4 HCAPLUS

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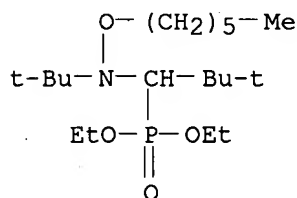
RN 288583-07-3 HCAPLUS

CN 3,7-Dioxa-4-aza-6-phosphanonanoic acid, 4,5-bis(1,1-dimethylethyl)-6-ethoxy-2,2-dimethyl-, methyl ester, 6-oxide (9CI) (CA INDEX NAME)



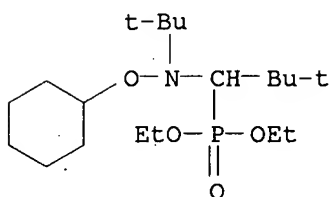
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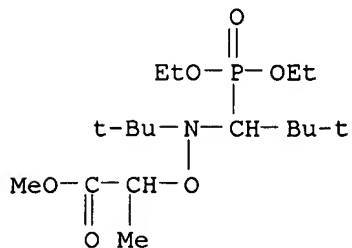
RN 288583-10-8 HCAPLUS

CN Phosphonic acid, [1-[(cyclohexyloxy)(1,1-dimethylethyl)amino]-2,2-dimethylpropyl]-, diethyl ester (9CI) (CA INDEX NAME)



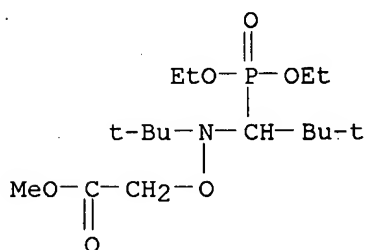
RN 300811-93-2 HCAPLUS

CN 3,7-Dioxa-4-aza-6-phosphanonanoic acid, 4,5-bis(1,1-dimethylethyl)-6-ethoxy-2-methyl-, methyl ester, 6-oxide (9CI) (CA INDEX NAME)



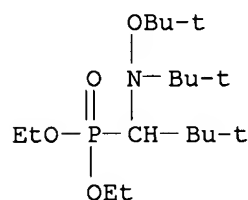
RN 462104-37-6 HCAPLUS

CN 3,7-Dioxa-4-aza-6-phosphanonanoic acid, 4,5-bis(1,1-dimethylethyl)-6-ethoxy-, methyl ester, 6-oxide (9CI) (CA INDEX NAME)



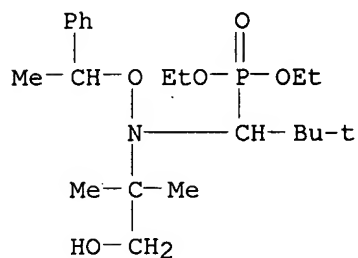
RN 462104-38-7 HCAPLUS

CN Phosphonic acid, [1-[(1,1-dimethylethoxy)(1,1-dimethylethyl)amino]-2,2-dimethylpropyl]-, diethyl ester (9CI) (CA INDEX NAME)



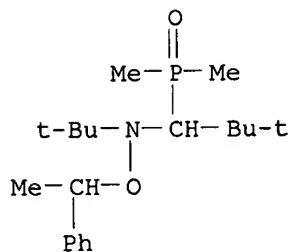
RN 462104-39-8 HCAPLUS

CN Phosphonic acid, [1-[(2-hydroxy-1,1-dimethylethyl)(1-phenylethoxy)amino]-2,2-dimethylpropyl]-, diethyl ester (9CI) (CA INDEX NAME)



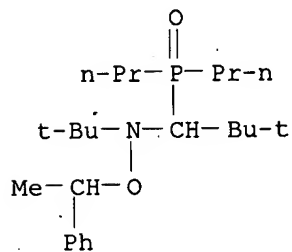
RN 462104-40-1 HCAPLUS

CN 1-Propanamine, N-(1,1-dimethylethyl)-1-(dimethylphosphinyl)-2,2-dimethyl-N-(1-phenylethoxy)- (9CI) (CA INDEX NAME)



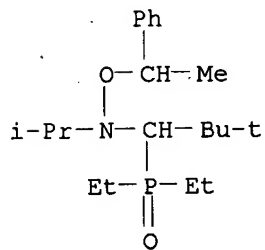
RN 462104-41-2 HCAPLUS

CN 1-Propanamine, N-(1,1-dimethylethyl)-1-(dipropylphosphinyl)-2,2-dimethyl-N-(1-phenylethoxy)- (9CI) (CA INDEX NAME)



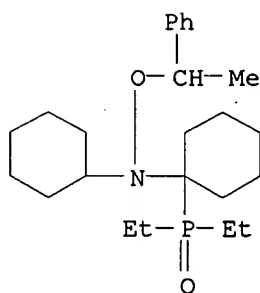
RN 462104-42-3 HCAPLUS

CN 1-Propanamine, 1-(diethylphosphinyl)-2,2-dimethyl-N-(1-methylethyl)-N-(1-phenylethoxy)- (9CI) (CA INDEX NAME)



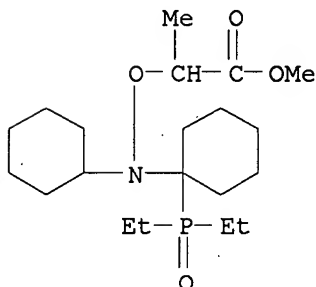
RN 462104-43-4 HCAPLUS

CN Cyclohexanamine, N-cyclohexyl-1-(diethylphosphinyl)-N-(1-phenylethoxy)- (9CI) (CA INDEX NAME)



RN 462104-44-5 HCAPLUS

CN Propanoic acid, 2-[[cyclohexyl[1-(diethylphosphinyl)cyclohexyl]amino]oxy]-, methyl ester (9CI) (CA INDEX NAME)



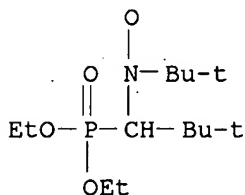
IT 188526-94-5P 188707-72-4P 258354-63-1P  
 258354-64-2P 263355-91-5P 339127-95-6P  
 462104-32-1P 462104-33-2P 462104-34-3P  
 462104-35-4P 462104-36-5P

RL: CAT (Catalyst use); SPN (Synthetic preparation); PREP  
 (Preparation); USES (Uses)

(.beta.-phosphorus nitroxides and alkoxyamines in controlled/living radical polymn.)

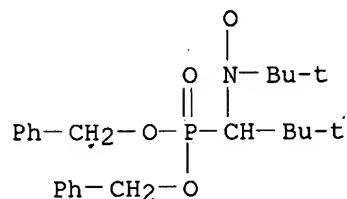
RN 188526-94-5 HCAPLUS

CN Nitroxide, 1-(diethoxyphosphinyl)-2,2-dimethylpropyl 1,1-dimethylethyl (9CI) (CA INDEX NAME)

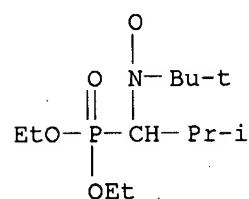


RN 188707-72-4 HCAPLUS

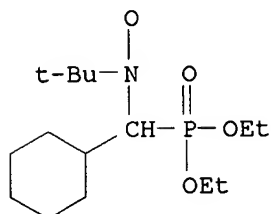
CN Nitroxide, 1-[bis(phenylmethoxy)phosphinyl]-2,2-dimethylpropyl 1,1-dimethylethyl (9CI) (CA INDEX NAME)



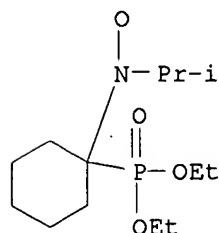
RN 258354-63-1 HCAPLUS  
 CN Nitroxide, 1-(diethoxyphosphinyl)-2-methylpropyl 1,1-dimethylethyl (9CI)  
 (CA INDEX NAME)



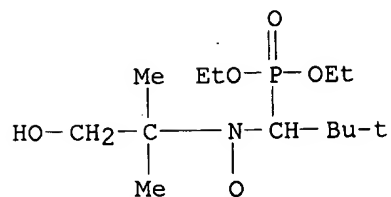
RN 258354-64-2 HCAPLUS  
 CN Nitroxide, cyclohexyl(diethoxyphosphinyl)methyl 1,1-dimethylethyl (9CI)  
 (CA INDEX NAME)



RN 263355-91-5 HCAPLUS  
 CN Nitroxide, 1-(diethoxyphosphinyl)cyclohexyl 1-methylethyl (9CI) (CA INDEX NAME)

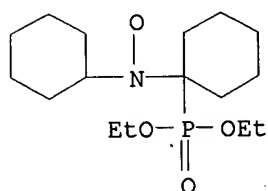


RN 339127-95-6 HCAPLUS  
 CN Nitroxide, 1-(diethoxyphosphinyl)-2,2-dimethylpropyl 2-hydroxy-1,1-dimethylethyl (9CI) (CA INDEX NAME)



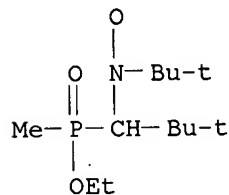
RN 462104-32-1 HCAPLUS

CN Nitroxide, cyclohexyl 1-(diethoxyphosphinyl)cyclohexyl (9CI) (CA INDEX NAME)



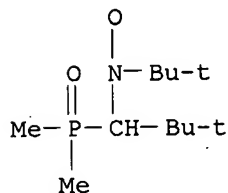
RN 462104-33-2 HCAPLUS

CN Nitroxide, 1,1-dimethylethyl 1-(ethoxymethylphosphinyl)-2,2-dimethylpropyl (9CI) (CA INDEX NAME)



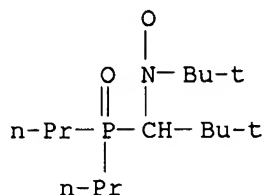
RN 462104-34-3 HCAPLUS

CN Nitroxide, 1,1-dimethylethyl 1-(dimethylphosphinyl)-2,2-dimethylpropyl (9CI) (CA INDEX NAME)



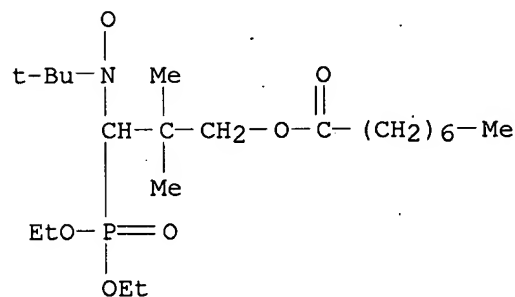
RN 462104-35-4 HCAPLUS

CN Nitroxide, 1,1-dimethylethyl 1-(dipropylphosphinyl)-2,2-dimethylpropyl (9CI) (CA INDEX NAME)



RN 462104-36-5 HCAPLUS

CN Nitroxide, 1-(diethoxyphosphinyl)-2,2-dimethyl-3-[(1-oxooctyl)oxy]propyl  
 1,1-dimethylethyl (9CI) (CA INDEX NAME)



L32 ANSWER 22 OF 59 HCAPLUS COPYRIGHT 2003 ACS

AN 2002:388070 HCAPLUS

DN 137:94092

TI Structural Characterization of Nitroxide-Terminated Poly(n-butyl  
**acrylate**) Prepared in Bulk and Miniemulsion  
**Polymerizations**

AU Farcet, Celine; Belleney, Joeel; Charleux, Bernadette; Pirri, Rosangela

CS Laboratoire de Chimie Macromoléculaire UMR 7610, Université Pierre et  
 Marie Curie, Paris, 75252, Fr:

SO Macromolecules (2002), 35(13), 4912-4918

CODEN: MAMOBX; ISSN: 0024-9297

PB American Chemical Society

DT Journal

LA English

CC 35-4 (Chemistry of Synthetic High **Polymers**)

Section cross-reference(s): 36

AB The structure of "living" poly(Bu **acrylate**) homopolymers prepd.  
 via nitroxide-mediated controlled radical **polymn.** in bulk and in  
 miniemulsion at 112 .degree.C was examd. by SEC, NMR, and MALDI-TOF mass  
 spectrometry to study the influence of chain transfer to polymer. The  
 absence of detectable terminal unsatn. was confirmed by proton NMR. The  
 branched structure was obsd. by 13C NMR. MALDI-TOF MS demonstrated that  
 the majority of chains, even at high conversion, had the ideal structure  
 with one **initiator** fragment and one nitroxide end group. From  
 these results, we concluded that intramol. chain transfer occurred  
 (presumably by back-biting) and was the predominant mechanism throughout  
 the **polymn.** at 112 .degree.C.

ST branching butyl **acrylate** nitroxide mediated controlled radical  
**polymn**

IT Chain transfer



- (branching of nitroxide-terminated poly(n-Bu acrylate) prep'd. in bulk and miniemulsion polymns.)
- IT Polymer chains  
(branching; branching of nitroxide-terminated poly(n-Bu acrylate) prep'd. in bulk and miniemulsion polymns.)
- IT **Polymerization**  
(emulsion, radical; branching of nitroxide-terminated poly(n-Bu acrylate) prep'd. in bulk and miniemulsion polymns.)
- IT **Polymerization**  
**Polymerization catalysts**  
(radical; branching of nitroxide-terminated poly(n-Bu acrylate) prep'd. in bulk and miniemulsion polymns.)
- IT **188526-94-5, N-tert-Butyl-1-diethylphosphono-2,2-dimethylpropyl nitroxide 300811-93-2**  
RL: **CAT (Catalyst use); USES (Uses)**  
(branching of nitroxide-terminated poly(n-Bu acrylate) prep'd. in bulk and miniemulsion polymns.)
- IT 9003-49-0P, Poly(butyl acrylate)  
RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)  
(branching of nitroxide-terminated poly(n-Bu acrylate) prep'd. in bulk and miniemulsion polymns.)

RE.CNT 31 THERE ARE 31 CITED REFERENCES AVAILABLE FOR THIS RECORD

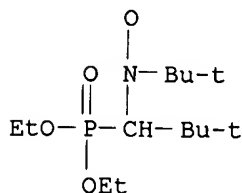
RE

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  - (2) Anon; ACS Symp Ser 1998, V685
  - (3) Anon; ACS Symp Ser 2000, V768
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  - (6) Benoit, D; Ph D Dissertation, University of Bordeaux I 1997
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  - (12) Farcet, C; Macromolecules 2001, V34, P3823 HCAPLUS
  - (13) Farcet, C; Submitted
  - (14) Georges, M; Macromolecules 1993, V26, P2987 HCAPLUS
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  - (16) Grimaldi, S; Macromolecules 2000, V33, P1141 HCAPLUS
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  - (18) Hawker, C; J Am Chem Soc 1994, V116, P11185 HCAPLUS
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  - (21) Moad, G; Comprehensive Polymer Science 1989, V3, P147
  - (22) Plessis, C; Macromolecules 2000, V33, P5041 HCAPLUS
  - (23) Qiu, J; Prog Polym Sci 2001, V26, P2083 HCAPLUS
  - (24) Robin, S; ACS Symp Ser 2000, V768, P334 HCAPLUS
  - (25) Robin, S; Macromol Symp 2001, V165, P43 HCAPLUS
  - (26) Robin, S; Macromolecules 2002, V35, P2481 HCAPLUS
  - (27) Roos, S; Macromol Rapid Commun 2000, V21, P864 HCAPLUS
  - (28) Solomon, D; US 4581429 1985 HCAPLUS
  - (29) van Herk, A; Macromol Rapid Commun 2001, V22, P687 HCAPLUS
  - (30) Wang, J; J Am Chem Soc 1995, V117, P5614 HCAPLUS
  - (31) Yamada, B; Polymer 2000, V41, P5611 HCAPLUS
- IT **188526-94-5, N-tert-Butyl-1-diethylphosphono-2,2-dimethylpropyl nitroxide 300811-93-2**

RL: CAT (Catalyst use); USES (Uses)  
(branching of nitroxide-terminated poly(n-Bu acrylate) prepd. in bulk and miniemulsion polymns.)

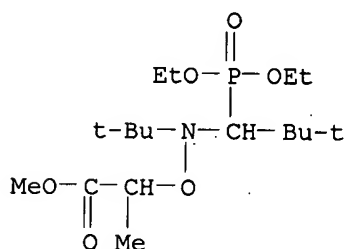
RN 188526-94-5 HCAPLUS

CN Nitroxide, 1-(diethoxyphosphinyl)-2,2-dimethylpropyl 1,1-dimethylethyl (9CI) (CA INDEX NAME)



RN 300811-93-2 HCAPLUS

CN 3,7-Dioxa-4-aza-6-phosphanonanoic acid, 4,5-bis(1,1-dimethylethyl)-6-ethoxy-2-methyl-, methyl ester, 6-oxide (9CI) (CA INDEX NAME)



L32 ANSWER 23 OF 59 HCAPLUS COPYRIGHT 2003 ACS

AN 2002:368534 HCAPLUS

DN 136:386580

TI Polymerization of vinyl chloride in the presence of a stable nitroxyl radical

IN Pfaendner, Rudolf; Wannemacher, Thomas; Braun, Dietrich

PA Ciba Specialty Chemicals Holding Inc., Switz.

SO PCT Int. Appl., 32 pp.

CODEN: PIXXD2

DT Patent

LA English

IC ICM C08F014-06

CC 35-3 (Chemistry of Synthetic High Polymers)

FAN.CNT 1

|    | PATENT NO.  | KIND | DATE     | APPLICATION NO. | DATE     |
|----|---|------|----------|-----------------|----------|
| PI | WO 2002038632   | A1   | 20020516 | WO 2001-EP12820 | 20011106 |
|    | W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM |      |          |                 |          |
|    | RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY,   |      |          |                 |          |

DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR, BF,  
 BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG

AU 2002021813 A5 20020521 AU 2002-21813 20011106  
 PRAI EP 2000-811066 A 20001113  
 WO 2001-EP12820 W 20011106

OS MARPAT 136:386580

AB Present invention pertains to a process for controlled **free radical polymn.** or copolymn. of vinyl chloride at 40-95.degree., at a pressure 5-30 bar in the presence of a stable **free nitroxyl radical**. Thus, 62.5 g vinyl chloride, 234 mg polyvinylalc., 30 mg citric acid, 0.1 mol% (based on vinyl chloride) Luperox (1,1-dimethyl-2-ethylhexaneperoxoat), and 0.05 mol% (based on vinyl chloride) di-tert-Bu nitroxide were agitated at 70-85.degree. and 12-18 bar for 21 h to give a polymer with 57% yield, Mn 29,000, Mw 64,000, and PD 2.2.

ST vinyl chloride polymer prepn polymn catalyst stable nitroxyl radical

IT Polymerization catalysts  
 (radical; polymn. of vinyl chloride in presence of stable nitroxyl radical)

IT 686-31-7 2406-25-9, Di-tert-butyl nitroxide 51210-48-1  
 188526-94-5 244021-05-4 264279-93-8 264280-22-0  
 405940-70-7

RL: **CAT (Catalyst use); USES (Uses)**  
 (polymn. of vinyl chloride in presence of stable nitroxyl radical)

IT 9002-86-2P, Vinyl chloride homopolymer 25134-83-2P, Methyl **methacrylate**-vinyl chloride copolymer 25214-53-3P, Butyl **methacrylate**-vinyl chloride copolymer 25214-59-9P, Styrene-vinyl chloride copolymer 25231-96-3P, **Acrylonitrile**-styrene-vinyl chloride copolymer 25702-34-5P, Butyl **acrylate**-vinyl chloride copolymer 25822-14-4P, Butadiene-vinyl chloride copolymer 34738-89-1P 425637-16-7P

RL: IMF (Industrial manufacture); PREP (Preparation)  
 (polymn. of vinyl chloride in presence of stable nitroxyl radical)

RE.CNT 2 THERE ARE 2 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE

(1) Gorki Univ Chem Res; SU 1235872 A 1986 HCAPLUS

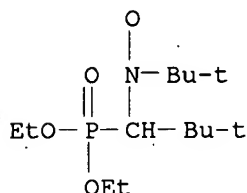
(2) Pierre, F; WO 9624620 A 1996 HCAPLUS

IT 188526-94-5

RL: **CAT (Catalyst use); USES (Uses)**  
 (polymn. of vinyl chloride in presence of stable nitroxyl radical)

RN 188526-94-5 HCAPLUS

CN Nitroxide, 1-(diethoxyphosphinyl)-2,2-dimethylpropyl 1,1-dimethylethyl (9CI) (CA INDEX NAME)



L32 ANSWER 24 OF 59 HCAPLUS COPYRIGHT 2003 ACS  
 AN 2002:319042 HCAPLUS

- DN 137:20639
- TI Synthesis and Characterization of Poly(styrene-b-n-butyl acrylate-b-styrene) Triblock Copolymers Using a Dialkoxyamine as **Initiator**
- AU Robin, Sophie; Guerret, Olivier; Couturier, Jean-Luc; Pirri, Rosangela; Gnanou, Yves
- CS Laboratoire de Chimie des Polymeres Organiques, ENSCPB-CNRS-Universite Bordeaux 1, Talence, 33402, Fr.
- SO Macromolecules (2002), 35(10), 3844-3848  
CODEN: MAMOBX; ISSN: 0024-9297
- PB American Chemical Society
- DT Journal
- LA English
- CC 35-3 (Chemistry of Synthetic High **Polymers**)
- AB This study investigates the ability of a novel difunctional alkoxyamine based on N-tert-butyl-1-diethylphosphono-2,2-dimethylpropyl nitroxide (SG1) to serve as **initiator** for the controlled radical **polymn.** of styrene (S) and Bu **acrylate** (nBuA). The efficiency of this **initiator** was checked using three different methods. After we set up the conditions best suited to the synthesis of perfectly difunctional poly(Bu **acrylate**) (PnBuA) samples, well-defined poly(styrene-b-Bu **acrylate**-b-styrene) triblock copolymers could be obtained by sequential **polymn.** of the corresponding monomers. However, a loss of control of the targeted structure was obsd. whenever the conversion of styrene exceeded 40%.
- ST styrene acrylate triblock copolymer prepn dialkoxyamine **initiator**
- IT **Polymerization** catalysts  
(prepn. and characterization of Bu **acrylate**-styrene triblock copolymers using dialkoxyamine as **initiator**)
- IT 188526-94-5, N-tert-Butyl-1-diethylphosphono-2,2-dimethylpropyl nitroxide  
RL: CAT (Catalyst use); USES (Uses)  
(**initiators**; **polymn.** of Bu **acrylate** using dialkoxyamine as **initiator** and)
- IT 300811-94-3  
RL: CAT (Catalyst use); USES (Uses)  
(**initiators**; prepn. and characterization of Bu acrylate-styrene triblock copolymers using dialkoxyamine as **initiator**).
- IT 9003-49-0P, Poly(butyl **acrylate**) 9003-53-6P, Polystyrene  
RL: SPN (Synthetic preparation); PREP (Preparation)  
(**polymn.** of Bu **acrylate** and styrene in presence of dialkoxyamine as **initiator**)
- IT 110772-34-4P, Butyl acrylate-styrene block copolymer  
RL: SPN (Synthetic preparation); PREP (Preparation)  
(triblock; prepn. and characterization of Bu acrylate-styrene triblock copolymers using dialkoxyamine as **initiator**)
- RE.CNT 21 THERE ARE 21 CITED REFERENCES AVAILABLE FOR THIS RECORD
- RE
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  - (2) Benoit, D; J Am Chem Soc 1999, V121, P3904 HCAPLUS
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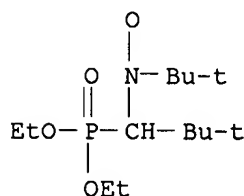
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 (20) Robin, S; Polym Prepr 2000, V41, P1352  
 (21) Tong, J; Polymer, in press 1999

IT 188526-94-5, N-tert-Butyl-1-diethylphosphono-2,2-dimethylpropyl nitroxide.

RL: CAT (Catalyst use); USES (Uses)  
 (initiators; polymn. of Bu acrylate using  
 dialkoxyamine as initiator and)

RN 188526-94-5 HCAPLUS

CN Nitroxide, 1-(diethoxyphosphinyl)-2,2-dimethylpropyl 1,1-dimethylethyl  
 (9CI) (CA INDEX NAME)

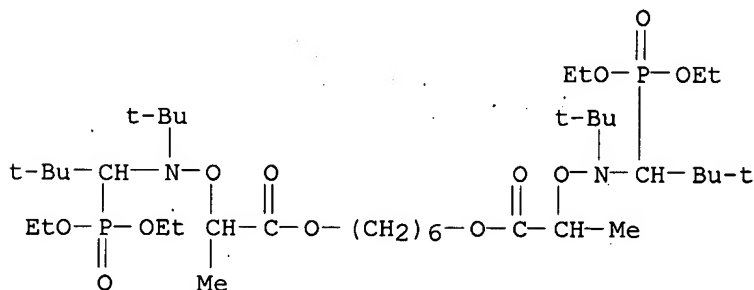


IT 300811-94-3

RL: CAT (Catalyst use); USES (Uses)  
 (initiators; prepn. and characterization of Bu  
 acrylate-styrene triblock copolymers using dialkoxyamine as  
 initiator)

RN 300811-94-3 HCAPLUS

CN 3,7-Dioxa-4-aza-6-phosphanonanoic acid, 4,5-bis(1,1-dimethylethyl)-6-ethoxy-2-methyl-, 1,6-hexanediyl ester, 6,6'-dioxide (9CI) (CA INDEX NAME)



L32 ANSWER 25 OF 59 HCAPLUS COPYRIGHT 2003 ACS

AN 2002:151910 HCAPLUS

DN 136:325922

- TI Synthesis of Stars and Starlike Block Copolymers from a Trialkoxyamine Used as **Initiator**
- AO Robin, Sophie; Guerret, Olivier; Couturier, Jean-Luc; Gnanou, Yves
- CS Laboratoire de Chimie des Polymeres Organiques, ENSCPB-CNRS-Universite Bordeaux-I, Talence, 33402, Fr.
- SO Macromolecules (2002); 35(7), 2481-2486  
CODEN: MAMOBX; ISSN: 0024-9297
- PB American Chemical Society
- DT Journal
- LA English
- CC 35-4 (Chemistry of Synthetic High **Polymers**)
- AB This study investigates the efficiency of a novel trifunctional alkoxyamine (1) based on N-tert-butyl-1-diethylphosphono-2,2-dimethylpropyl nitroxide (SG1) (2) as **initiator** for the controlled radical **polymn.** of styrene (S) and Bu **acrylate** (nBuA). Three factors, namely the concn. of SG1 initially introduced in excess, the monomer conversion, and-in the specific case of PS samples-the monomer autopolymn., were found to control the quality of the star samples obtained. Well-defined T-(PBuA-b-PS)<sub>3</sub> star block copolymers could also be synthesized by sequential copolymn. using the same trifunctional **initiator**.
- ST styrene butyl **acrylate** star block copolymer **polymn** catalyst; trifunctional alkoxyamine nitroxide **polymn** **initiator** controlled radical **polymn**
- IT Polymerization  
(radical; synthesis of stars and starlike block copolymers from a trialkoxyamine used as **initiator**)
- IT Polymers, preparation  
RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)  
(star-branched; synthesis of stars and starlike block copolymers from a trialkoxyamine used as **initiator**)
- IT Molecular weight  
Molecular weight distribution  
Polymerization catalysts  
(synthesis of stars and starlike block copolymers from a trialkoxyamine used as **initiator**)
- IT 188526-94-5  
RL: CAT (**Catalyst use**); RCT (Reactant); RACT (Reactant or reagent); USES (Uses)  
(catalyst; in synthesis of stars and starlike block copolymers from a trialkoxyamine used as **initiator**)
- IT 224575-62-6P  
RL: CAT (**Catalyst use**); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)  
(catalyst; in synthesis of stars and starlike block copolymers from a trialkoxyamine used as **initiator**)
- IT 300811-95-4P  
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)  
(catalyst; in synthesis of stars and starlike block copolymers from a trialkoxyamine used as **initiator**)
- IT 563-76-8, 2-Bromopropionyl bromide 585-71-7, 1-Phenylethyl bromide 839-90-7, 1,3,5-Tris(2-hydroxyethyl)-1,3,5-triazine-2,4,6(1H,3H,5H)-trione  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(in synthesis of stars and starlike block copolymers from a trialkoxyamine used as **initiator**)
- IT 9003-53-6P, Polystyrene  
RL: PRP (Properties); RCT (Reactant); SPN (Synthetic preparation); PREP

(Preparation); RACT (Reactant or reagent)

(star-branched; synthesis of stars and starlike block copolymers from a trialkoxyamine used as **initiator**)

IT 9003-53-6DP, Polystyrene, **initiated** by trifunctional catalyst, hydrolyzed thereafter 110772-34-4P, Butyl acrylate-styrene block copolymer

RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)

(star-branched; synthesis of stars and starlike block copolymers from a trialkoxyamine used as **initiator**)

IT 9003-49-0P, Butyl acrylate homopolymer

RL: PRP (Properties); RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)

(tri-branched, as macroinitiator; synthesis of stars and starlike block copolymers from a trialkoxyamine used as **initiator**)

RE.CNT 26 THERE ARE 26 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE

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- (2) Baumert, M; Macromol Rapid Commun 2000, V21, P271 HCAPLUS
- (3) Benoit, D; ACS Symp Ser 1998, V685, P225 HCAPLUS
- (4) Benoit, D; J Am Chem Soc 1999, V121, P3904 HCAPLUS
- (5) Benoit, D; J Am Chem Soc 2000, V122, P5929 HCAPLUS
- (6) Benoit, D; Macromolecules 2000, V33, P1505 HCAPLUS
- (7) Benoit, D; Macromolecules 2000, V33, P363 HCAPLUS
- (8) Borhisch, J; Macromol Rapid Commun 1997, V18, P975
- (9) Bouix, M; Macromol Rapid Commun 1998, V19, P209 HCAPLUS
- (10) Couturier, J; FR 990445
- (11) Gillet, J; FR 9900127
- (12) Guérret, O; FR 9906329
- (13) Hawker, C; Angew Chem, Int Ed Engl 1995, V34, P1456 HCAPLUS
- (14) Hawker, C; J Am Chem Soc 1995, V117, P10763 HCAPLUS
- (15) Hawker, C; Macromol Chem Phys 1997, V198, P155 HCAPLUS
- (16) Keoshkerian, B; Macromolecules 2001, V34, P3594 HCAPLUS
- (17) Le Mercier, C; ACS Symp Ser 2000, V768, P108 HCAPLUS
- (18) Listigovers, N; Macromolecules 1996, V29, P8992 HCAPLUS
- (19) Mariani, M; J Polym Sci, Polym Chem 1999, V37, P1237 HCAPLUS
- (20) Marque, S; Macromolecules 2000, V33, P4403 HCAPLUS
- (21) Matyjaszewski, K; Macromolecules 1998, V31, P5955 HCAPLUS
- (22) Miura, Y; Polym Bull (Berlin) 1999, V42, P17 HCAPLUS
- (23) Robin, S; ACS Symp Ser 2000, V768, P334 HCAPLUS
- (24) Robin, S; Macromol Symp 2001, V165, P43 HCAPLUS
- (25) Robin, S; Polym Prepr 2000, V41, P1352
- (26) Yoshida, E; Macromolecules 1994, V27, P319

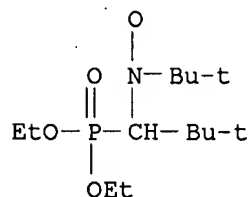
IT 188526-94-5

RL: CAT (Catalyst use); RCT (Reactant); RACT (Reactant or reagent); USES (Uses)

(catalyst; in synthesis of stars and starlike block copolymers from a trialkoxyamine used as **initiator**)

RN 188526-94-5 HCAPLUS

CN Nitroxide, 1-(diethoxyphosphinyl)-2,2-dimethylpropyl 1,1-dimethylethyl (9CI) (CA INDEX NAME)



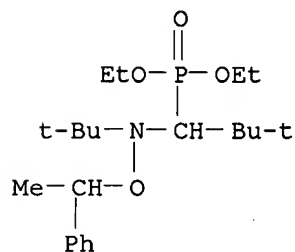
IT 224575-62-6P

RL: CAT (Catalyst use); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)

(catalyst; in synthesis of stars and starlike block copolymers from a trialkoxyamine used as initiator)

RN 224575-62-6 HCAPLUS

CN Phosphonic acid, [1-[(1,1-dimethylethyl)(1-phenylethoxy)amino]-2,2-dimethylpropyl]-, diethyl ester (9CI) (CA INDEX NAME)



L32 ANSWER 26 OF 59 HCAPLUS COPYRIGHT 2003 ACS

AN 2002:90635 HCAPLUS

DN 136:135169

TI Controlled **free radical** emulsion and water-based **polymerizations** and seeded methodologies

IN Klaerner, Gerrit; Safir, Adam; Nielsen, Ralph B.; Jandeleit, Bernd; Huefner, Peter; Li, Yunxiao

PA Symyx Technologies Inc., USA

SO U.S. Pat. Appl. Publ., 64 pp., Cont.-in-part of U.S. Ser. No. 347,606. CODEN: USXXCO

DT Patent

LA English

IC ICM C08F004-00

NCL 526075000

CC 35-3 (Chemistry of Synthetic High **Polymers**)

FAN.CNT 4

|      | PATENT NO.      | KIND | DATE     | APPLICATION NO. | DATE     |
|------|-----------------|------|----------|-----------------|----------|
| PI   | US 2002013430   | A1   | 20020131 | US 2000-520583  | 20000308 |
|      | US 6559255      | B2   | 20030506 |                 |          |
|      | US 2002001845   | A1   | 20020103 | US 2001-911683  | 20010724 |
| PRAI | US 1999-123498P | P    | 19990309 |                 |          |
|      | US 1999-347606  | A2   | 19990702 |                 |          |
|      | US 1999-347607  | A3   | 19990702 |                 |          |
|      | US 1999-347608  | A3   | 19990702 |                 |          |
|      | US 1999-347609  | A3   | 19990702 |                 |          |



US 1999-146936P P 19990731  
 US 2000-177879P P 20000124  
 US 2000-609461 A3 20000703

AB Nitroxides having an alpha-carbon atom with a destabilizing moiety such as H are effective control agents for emulsion and water-based polymns., including the formation of block copolymers from a wide range of monomers. The nitroxide radicals may be used as a free radical or as an adduct with a residue from the initiator. The emulsions have living characteristics, including the re-initiation of polymer chains. Also, a seeded process for emulsions, which includes the step-wise addn. of monomer is disclosed, providing access to a wide range of initiator types.

ST radical emulsion polymn alpha hydrido nitroxide control agent

IT Nitroxides

RL: CAT (Catalyst use); IMF (Industrial manufacture); PREP (Preparation); USES (Uses)

(controlled free radical emulsion and water-based polymns. and seeded methodologies using nitroxides or their adducts with initiators or initiator fragments)

IT **Polymerization catalysts**

(**radical; controlled free radical**

emulsion and water-based polymns. and seeded methodologies using nitroxides or their adducts with initiators or initiator fragments)

IT 27776-21-2, Vazo 044

RL: CAT (Catalyst use); USES (Uses)

(Vazo 044; controlled free radical emulsion and water-based polymns. and seeded methodologies using nitroxides or their adducts with initiators or initiator fragments)

IT 28445-37-6P 227000-85-3P 293328-11-7P **293328-12-8P**

293328-13-9P 293328-14-0P 293328-15-1P 293328-16-2P 293328-17-3P

293328-18-4P **293328-19-5P** 293328-20-8P **293328-21-9P**

293328-22-0P 293328-23-1P

RL: CAT (Catalyst use); IMF (Industrial manufacture); PREP (Preparation); USES (Uses)

(control-agent adduct; controlled free radical emulsion and water-based polymns. and seeded methodologies using nitroxides or their adducts with **initiators or initiator** fragments)

IT 10250-27-8P 19312-05-1P 55277-95-7P 72877-60-2P,

N-tert-Butyl-.alpha.-(3-pyridyl)nitron 270901-81-0P 293328-26-4P

393110-72-0P

RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)

(control-agent precursor; controlled free radical emulsion and water-based polymns. and seeded methodologies using nitroxides or their adducts with initiators or initiator fragments)

IT 100-44-7, Benzyl chloride, reactions 124-68-5 500-22-1,

Pyridine-3-carboxaldehyde 1068-55-9, Isopropylmagnesium chloride

1122-91-4, 4-Bromobenzaldehyde 3376-24-7, N-tert-Butyl-.alpha.-

phenylnitron 18162-48-6, tert-Butyldimethylchlorosilane 57497-39-9,

N-tert-Butylhydroxylamine hydrochloride

RL: RCT (Reactant); RACT (Reactant or reagent)

(control-agent precursor; controlled free radical emulsion and water-based polymns. and seeded methodologies using nitroxides or their adducts with initiators or initiator fragments)

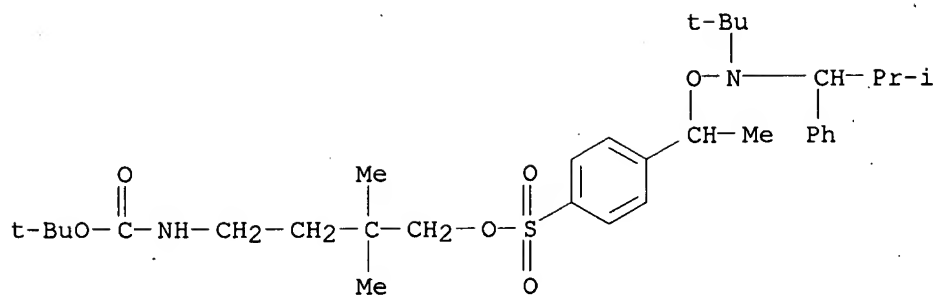
IT 179419-05-7P 293328-09-3P, Dimethyl 5-vinylisophthalate 293328-10-6P

393110-71-9P

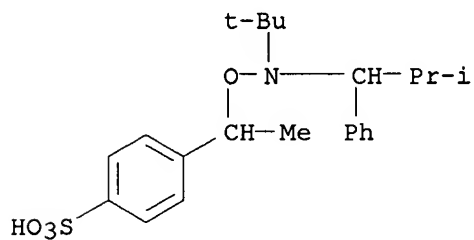
RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)

(control-agent-adduct precursor; controlled free radical emulsion and

- water-based polymns. and seeded methodologies using nitroxides or their adducts with initiators or initiator fragments)
- IT 78-67-1, AIBN 100-42-5, Styrene, reactions 100-43-6, 4-Vinylpyridine 1112-56-7, Tetravinyltin 1592-20-7, 4-Chloromethylstyrene 2039-82-9, 4-Bromostyrene 2633-67-2, 4-Chlorosulfonylstyrene 3317-61-1, 5,5-Dimethyl-.DELTA.1-pyrroline N-oxide 6921-35-3, 3,3-Dimethyloxetane 24424-99-5, Di-tert-butyl dicarbonate 51760-21-5, Dimethyl 5-bromoisophthalate
- RL: RCT (Reactant); RACT (Reactant or reagent)  
(control-agent-adduct precursor; controlled free radical emulsion and water-based polymns. and seeded methodologies using nitroxides or their adducts with initiators or initiator fragments)
- IT 75-91-2, tert-Butyl hydroperoxide 7727-21-1, Potassium persulfate 227000-59-1
- RL: CAT (Catalyst use); USES (Uses)  
(controlled free radical emulsion and water-based polymns. and seeded methodologies using nitroxides or their adducts with initiators or initiator fragments)
- IT 61015-94-9P 293328-07-1P 293328-08-2P 293328-27-5P
- RL: CAT (Catalyst use); IMF (Industrial manufacture); PREP (Preparation); USES (Uses)  
(controlled free radical emulsion and water-based polymns. and seeded methodologies using nitroxides or their adducts with initiators or initiator fragments)
- IT 9003-53-6P, Polystyrene 107391-68-4P, Butyl methacrylate-styrene block copolymer 110772-34-4P, Butyl acrylate-styrene block copolymer 120293-17-6P, Acrylic acid-styrene block copolymer 131830-42-7P, Acrylic acid-butyl acrylate-styrene block copolymer 293328-28-6P, 2-Acrylamido-2-methylpropanesulfonic acid-N-tert-butylacrylamide-styrene copolymer 393110-73-1P, 2-Acrylamido-2-methylpropanesulfonic acid-N-tert-butylacrylamide-butyl methacrylate-styrene copolymer 393110-74-2P, 2-Acrylamido-2-methylpropanesulfonic acid-N-tert-butylacrylamide-methyl methacrylate-2-(2-oxo-1-imidazolidinyl)ethyl methacrylate-styrene copolymer
- RL: IMF (Industrial manufacture); PREP (Preparation)  
(controlled free radical emulsion and water-based polymns. and seeded methodologies using nitroxides or their adducts with initiators or initiator fragments)
- IT 76790-28-8P, N-tert-Butyl-.alpha.-(4-bromophenyl)nitro
- RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)  
(controlled free radical emulsion and water-based polymns. and seeded methodologies using nitroxides or their adducts with initiators or initiator fragments)
- IT 293328-12-8P 293328-19-5P 293328-21-9P
- RL: CAT (Catalyst use); IMF (Industrial manufacture); PREP (Preparation); USES (Uses)  
(control-agent adduct; controlled free radical emulsion and water-based polymns. and seeded methodologies using nitroxides or their adducts with **initiators** or **initiator** fragments)
- RN 293328-12-8 HCAPLUS
- CN Benzenesulfonic acid, 4-[1-[[[(1,1-dimethylethyl)(2-methyl-1-phenylpropyl)amino]oxy]ethyl]-, 4-[[[(1,1-dimethylethoxy)carbonyl]amino]-2,2-dimethylbutyl ester (9CI) (CA INDEX NAME)

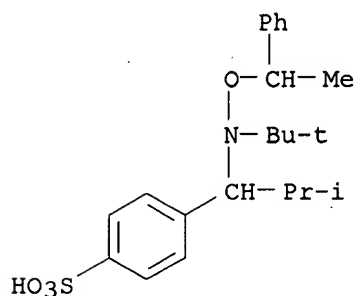


RN 293328-19-5 HCAPLUS  
 CN Benzenesulfonic acid, 4-[1-[(1,1-dimethylethyl)(2-methyl-1-phenylpropyl)amino]oxy]ethyl]-, sodium salt (9CI) (CA INDEX NAME)



● Na

RN 293328-21-9 HCAPLUS  
 CN Benzenesulfonic acid, 4-[1-[(1,1-dimethylethyl)(1-phenylethoxy)amino]-2-methylpropyl]-, lithium salt (9CI) (CA INDEX NAME)



● Li

L32 ANSWER 27 OF 59 HCAPLUS COPYRIGHT 2003 ACS  
 AN 2001:886252 HCAPLUS  
 DN 136:20364  
 TI Catalysts of transition metal complex with a ligand for olefin

polymerization  
 IN Wang, Lin; Hauptman, Elisabeth; Johnson, Lynda K.; McCord, Elizabeth F.;  
 Wang, Ying; Ittel, Steven D.  
 PA E.I. Du Pont De Nemours and Company, USA  
 SO PCT Int. Appl., 190 pp.  
 CODEN: PIXXD2  
 DT Patent  
 LA English  
 IC ICM C08F004-00  
 CC 35-4 (Chemistry of Synthetic High Polymers)  
 Section cross-reference(s): 67

FAN.CNT 5

|    | PATENT NO.    | KIND   | DATE     | APPLICATION NO. | DATE     |
|----|---------------|--|----------|-----------------|----------|
| PI | WO 2001092342 | A2   | 20011206 | WO 2001-US17627 | 20010531 |
|    | WO 2001092342 | A3   | 20030116 |                 |          |
|    | W:            | AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM |          |                 |          |
|    | RW:           | GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG   |          |                 |          |
|    | AU 2001075070 | A5   | 20011211 | AU 2001-75070   | 20010531 |
|    | US 2002028897 | A1   | 20020307 | US 2001-870596  | 20010531 |
|    | US 2002037982 | A1   | 20020328 | US 2001-870597  | 20010531 |
|    | US 6541585    | B2   | 20030401 |                 |          |
|    | EP 1292624    | A2   | 20030319 | EP 2001-941742  | 20010531 |
|    | R:            | AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR   |          |                 |          |

PRAI US 2000-208087P P 20000531  
 US 2000-211601P P 20000615  
 US 2000-214036P P 20000623  
 US 2001-264537P P 20010125  
 WO 2001-US17627 W 20010531

OS MARPAT 136:20364

AB Transition metal complexes of selected monoanionic phosphine ligands, which also contain a selected Group 15 or 16 (IUPAC) element and which are coordinated to a Group 3 to 11 (IUPAC) transition metal or a lanthanide metal, are **polymn.** catalysts for the (co)**polymn.** of olefins such as ethylene and  $\alpha$ -olefins, and the copolymn. of such olefins with polar group-contg. olefins. These and other nickel complexes of neutral and monoanionic bidentate ligands copolymerize ethylene and polar comonomers, esp. **acrylates**, at relatively high ethylene pressures and surprisingly high temps., and give good incorporation of the polar comonomers and good polymer productivity. These copolymers are often unique structures, which are described.

ST polymn catalyst transition metal complex phosphine ligand prepn

IT Aluminoxanes

RL: CAT (Catalyst use); USES (Uses)

(Me; catalysts of transition metal complex with a ligand for olefin polymn.)

IT Polymerization catalysts

(catalysts of transition metal complex with a ligand for olefin polymn.)

IT Transition metal complexes

- RL: CAT (Catalyst use); IMF (Industrial manufacture); PREP (Preparation); USES (Uses)  
(catalysts of transition metal complex with a ligand for olefin polymn.)
- IT Linear low density polyethylenes  
RL: IMF (Industrial manufacture); PRP (Properties); PREP (Preparation)  
(catalysts of transition metal complex with a ligand for olefin polymn.)
- IT Polyolefins  
RL: IMF (Industrial manufacture); PRP (Properties); PREP (Preparation)  
(catalysts of transition metal complex with a ligand for olefin polymn.)
- IT Ligands  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(catalysts of transition metal complex with a ligand for olefin polymn.)
- IT 74-85-1DP, Ethene, polymers with .alpha.-olefins polymers with .alpha.-olefins  
RL: IMF (Industrial manufacture); PRP (Properties); PREP (Preparation)  
(LLDPE; catalysts of transition metal complex with a ligand for olefin polymn.)
- IT 7631-86-9, XPO-2402, uses 64083-96-1, Synclyst MS 13  
RL: CAT (Catalyst use); USES (Uses)  
(catalyst support; catalysts of transition metal complex with a ligand for olefin polymn.)
- IT 960-71-4, Triphenylborane 1109-15-5, Tris(pentafluorophenyl)borane 7439-89-6, Iron, uses 7440-02-0, Nickel, uses 7440-05-3, Palladium, uses 7440-06-4, Platinum, uses 7440-32-6, Titanium, uses 7440-47-3, Chromium, uses 7440-48-4, Cobalt, uses 7440-50-8, Copper, uses 7440-58-6, Hafnium, uses 7440-62-2, Vanadium, uses 7440-67-7, Zirconium, uses  
RL: CAT (Catalyst use); USES (Uses)  
(catalysts of transition metal complex with a ligand for olefin polymn.)
- IT 37667-14-4DP, complexes with acenaphthylidene/ethylidenebenzenamine derivs. 49673-42-9DP, complexes with tetramethylethylenediamine/nickel acetylacetonate 56252-55-2P 134286-30-9P 201140-86-5P 202277-49-4DP, complexes with tetramethylethylenediamine/nickel acetylacetonate 210882-54-5P 378793-32-9P 378793-33-0P  
378793-34-1P 378793-53-4P 378793-60-3P 378795-57-4P 378795-58-5P  
378795-59-6P 378795-60-9P 378795-61-0P 378795-62-1P 378795-63-2P  
378795-64-3P 378795-65-4P 378795-66-5P 378795-67-6P 378795-68-7P  
378795-69-8P 378795-70-1P 378795-71-2P 378795-72-3P 378795-73-4P  
378795-74-5P 378795-75-6P 378795-76-7P 378795-77-8P 378795-78-9P  
378795-79-0P 378795-80-3P 378795-81-4P 378795-82-5P 378795-83-6P  
378795-84-7P 378795-85-8P 378795-86-9P 378795-87-0P 378795-88-1P  
378795-89-2P 378795-90-5P 378795-91-6P 378795-92-7P 378795-93-8P  
378795-94-9P 378795-95-0P 378795-96-1P 378795-97-2P 378795-98-3P  
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378796-09-9P 378796-11-3P 378796-13-5P 378796-15-7P 378796-17-9P  
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378796-49-7P 378796-51-1P 378796-53-3P 378796-55-5P 378796-57-7P  
378796-59-9P 378796-61-3P 378796-63-5P 378796-65-7P 378796-67-9P  
378796-69-1P 378796-71-5P 378796-73-7P 378796-75-9P 378796-77-1P  
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378796-89-5P 378796-91-9P 378796-93-1P 378796-95-3P 378796-97-5P

378796-98-6P 378796-99-7P 378797-00-3P 378797-01-4P 378797-02-5P  
 378797-03-6P 378797-04-7P 378797-06-9P 378797-08-1P 378797-10-5P  
 378797-12-7P 378797-14-9P 378797-16-1P 378797-18-3P 378797-19-4P  
 378797-21-8P 378797-23-0P 378797-24-1P **378797-25-2P**

**378797-26-3P 378797-27-4P 378797-28-5P**

RL: **CAT (Catalyst use)**; IMF (Industrial manufacture); PREP (Preparation); USES (Uses)

(catalysts of transition metal complex with a ligand for olefin polymn.)

IT 9002-88-4P, Ethylene homopolymer 25103-74-6P, Ethylene-methyl **acrylate** copolymer 25213-02-9P, Ethylene-1-hexene copolymer 26636-18-0P, Ethylene-hexyl **acrylate** copolymer 29433-67-8P 112155-82-5P 220230-29-5P 220230-30-8P 220230-39-7P 220230-51-3P 378793-58-9P 378797-34-3P, Ethylene-isodecyl **acrylate** copolymer

RL: IMF (Industrial manufacture); PRP (Properties); PREP (Preparation) (catalysts of transition metal complex with a ligand for olefin polymn.)

IT 289708-46-9P 289708-58-3P 289709-14-4P 330812-70-9P 378797-30-9P 378797-31-0P

RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)

(catalysts of transition metal complex with a ligand for olefin polymn.)

IT 378797-29-6P 378797-33-2P

RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)

(ligand; catalysts of transition metal complex with a ligand for olefin polymn.)

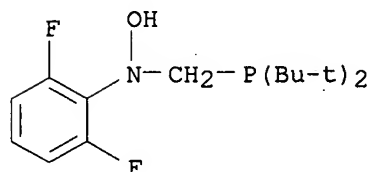
IT **378797-25-2P 378797-26-3P 378797-27-4P 378797-28-5P**

RL: **CAT (Catalyst use)**; IMF (Industrial manufacture); PREP (Preparation); USES (Uses)

(catalysts of transition metal complex with a ligand for olefin polymn.)

RN 378797-25-2 HCAPLUS

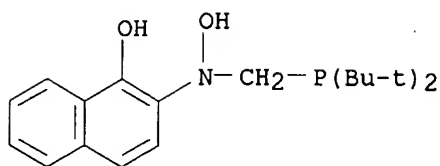
CN Benzenamine, N-[[bis(1,1-dimethylethyl)phosphino]methyl]-2,6-difluoro-N-hydroxy-, lithium salt (9CI) (CA INDEX NAME)



● Li

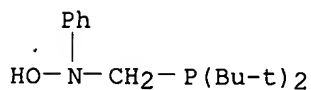
RN 378797-26-3 HCAPLUS

CN 1-Naphthalenol, 2-[[[bis(1,1-dimethylethyl)phosphino]methyl]hydroxyamino]-, dilithium salt (9CI) (CA INDEX NAME)



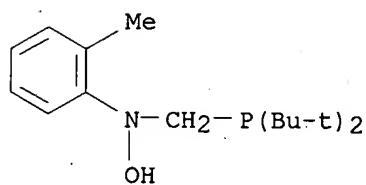
● 2 Li

RN 378797-27-4 HCAPLUS  
 CN Benzenamine, N-[[bis(1,1-dimethylethyl)phosphino]methyl]-N-hydroxy-,  
 lithium salt (9CI) (CA INDEX NAME)



● Li

RN 378797-28-5 HCAPLUS  
 CN Benzenamine, N-[[bis(1,1-dimethylethyl)phosphino]methyl]-N-hydroxy-2-  
 methyl-, lithium salt (9CI) (CA INDEX NAME)



● Li

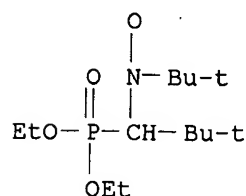
L32 ANSWER 28 OF 59 HCAPLUS COPYRIGHT 2003 ACS  
 AN 2001:818780 HCAPLUS  
 DN 136:86109  
 TI Living Radical Polymerization: Use of an Excess of Nitroxide as a Rate  
 Moderator  
 AU Lacroix-Desmazes, Patrick; Lutz, Jean-Francois; Chauvin, Florence;  
 Severac, Romain; Boutevin, Bernard  
 CS Laboratoire de Chimie Macromoleculaire, Ecole Nationale Supérieure de  
 Chimie de Montpellier, Montpellier, 34296, Fr.  
 SO Macromolecules (2001), 34(26), 8866-8871  
 CODEN: MAMOBX; ISSN: 0024-9297  
 PB American Chemical Society  
 DT Journal

- LA English
- CC 35-3 (Chemistry of Synthetic High Polymers)
- AB The kinetics of the living radical **polymn.** of Bu **acrylate** (BuA) in the presence of an excess of N-tert-butyl-N-(1-diethylphosphono-2,2-dimethylpropyl)-N-oxyl (DEPN) as a rate moderator has been studied in the temp. range 115-125 .degree.C. The equil. rate const.  $K = k_d/k_c$  between dormant and active chains was detd. exptl. from the slope of  $\ln([BuA]_0/[BuA])$  vs time. It obeys the following Arrhenius relation:  $K = 4.93 \cdot \text{times} \cdot 10^5 \exp(-119.3 \text{ kJ mol}^{-1}/RT)$ , i.e.,  $K = 1.09 \cdot \text{times} \cdot 10^{-10} \text{ mol L}^{-1}$  at 125 .degree.C. Some straightforward anal. kinetic equations that only depend on the excess of DEPN as the exptl. parameter were established. These equations were successfully applied to simulate the DEPN-mediated **polymn.** of Bu **acrylate** initiated by either a styryl-DEPN alkoxyamine or an AIBN/DEPN bicomponent system. Last, the slow degrdn. of DEPN was considered in order to account for the upward deviation of the kinetics when a great excess of DEPN was used.
- ST living radical **polymn** butyl **acrylate** nitroxide;  
kinetics radical **polymn** butyl **acrylate** nitroxide;  
phosphono nitroxide radical **polymn** butyl **acrylate**
- IT. **Polymerization catalysts**  
**Polymerization kinetics**  
(living, radical; kinetics of living radical **polymn.** of Bu **acrylate** in presence of tert-butyl(diethylphosphonodimethylpropyl)oxyl as rate moderator)
- IT 78-67-1, AIBN 188526-94-5, N-tert-Butyl-N-(1-diethylphosphono-2,2-dimethylpropyl)-N-oxyl 224575-62-6  
RL: CAT (Catalyst use); USES (Uses)  
(kinetics of living radical **polymn.** of Bu **acrylate** in presence of tert-butyl(diethylphosphonodimethylpropyl)oxyl as rate moderator)
- IT 9003-53-6DP, Polystyrene, reaction products with tert-butyl(diethylphosphonodimethylpropyl)oxyl 188526-94-5DP, reaction products with polystyrene  
RL: CAT (Catalyst use); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)  
(kinetics of living radical **polymn.** of Bu **acrylate** in presence of tert-butyl(diethylphosphonodimethylpropyl)oxyl as rate moderator)
- IT 141-32-2, Butyl **acrylate**  
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PRP (Properties); RCT (Reactant); PROC (Process); RACT (Reactant or reagent)  
(kinetics of living radical **polymn.** of Bu **acrylate** in presence of tert-butyl(diethylphosphonodimethylpropyl)oxyl as rate moderator)
- IT 9003-49-0P, Poly(butyl **acrylate**)  
RL: SPN (Synthetic preparation); PREP (Preparation)  
(kinetics of living radical **polymn.** of Bu **acrylate** in presence of tert-butyl(diethylphosphonodimethylpropyl)oxyl as rate moderator)
- RE.CNT 49 THERE ARE 49 CITED REFERENCES AVAILABLE FOR THIS RECORD
- RE
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  - (2) Anon; private communication from Guerret, O; Couturier, J-L
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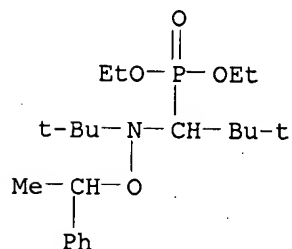


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  - (6) Benoit, D; Macromolecules 2000, V33, P363 HCAPLUS
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  - (49) Veregin, R; Macromolecules 1996, V29, P2746 HCAPLUS
- IT 188526-94-5, N-tert-Butyl-N-(1-diethylphosphono-2,2-dimethylpropyl)-N-oxyl 224575-62-6  
 RL: CAT (Catalyst use); USES (Uses)  
 (kinetics of living radical polymn. of Bu acrylate  
 in presence of tert-butyl(diethylphosphonodimethylpropyl)oxyl as rate

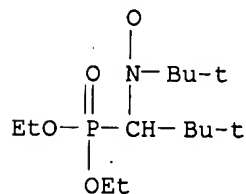
moderator)  
 RN 188526-94-5 HCAPLUS  
 CN Nitroxide, 1-(diethoxyphosphinyl)-2,2-dimethylpropyl 1,1-dimethylethyl  
 (9CI) (CA INDEX NAME)



RN 224575-62-6 HCAPLUS  
 CN Phosphonic acid, [1-[(1,1-dimethylethyl)(1-phenylethoxy)amino]-2,2-dimethylpropyl]-, diethyl ester (9CI) (CA INDEX NAME)



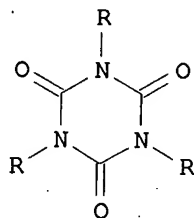
IT 188526-94-5DP, reaction products with polystyrene  
 RL: CAT (Catalyst use); SPN (Synthetic preparation); PREP  
 (Preparation); USES (Uses)  
 (kinetics of living radical **polymn.** of Bu **acrylate**  
 in presence of tert-butyl(diethylphosphonodimethylpropyl)oxyl as rate  
 moderator)  
 RN 188526-94-5 HCAPLUS  
 CN Nitroxide, 1-(diethoxyphosphinyl)-2,2-dimethylpropyl 1,1-dimethylethyl  
 (9CI) (CA INDEX NAME)



L32 ANSWER 29 OF 59 HCAPLUS COPYRIGHT 2003 ACS  
 AN 2001:747176 HCAPLUS  
 DN 135:289208  
 TI Multimodal polymers by controlled radical polymerization in the presence  
 of alkoxyamines  
 IN Guerret, Olivier; Robin, Sophie; Gnanou, Yves

PA Atofina, Fr.  
 SO Eur. Pat. Appl., 24 pp.  
 CODEN: EPXXDW  
 DT Patent  
 LA French  
 IC ICM C08F004-00  
 ICS C08F293-00; C08F002-38  
 CC 35-4 (Chemistry of Synthetic High Polymers)  
 FAN.CNT 1

|      | PATENT NO.  | KIND | DATE     | APPLICATION NO. | DATE     |
|------|---|------|----------|-----------------|----------|
| PI   | EP 1142913  | A1   | 20011010 | EP 2001-106802  | 20010319 |
|      | R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO |      |          |                 |          |
|      | FR 2807439  | A1   | 20011012 | FR 2000-4557    | 20000407 |
|      | CA 2343339  | AA   | 20011007 | CA 2001-2343339 | 20010406 |
|      | CN 1318570  | A    | 20011024 | CN 2001-117832  | 20010407 |
|      | JP 2001316409   | A2   | 20011113 | JP 2001-109720  | 20010409 |
|      | US 2002040117   | A1   | 20020404 | US 2001-828476  | 20010409 |
| PRAI | FR 2000-4557  | A    | 20000407 |                 |          |
| GI   |   |      |          |                 |          |



I, R=(CH<sub>2</sub>)<sub>2</sub>O<sub>2</sub>CCHMeON(CMe<sub>3</sub>)CH(CMe<sub>3</sub>)P(O)(OEt)<sub>2</sub>

AB Polymers with multimodal d.p. are manufd. by radical polymn. of monomers in the presence of alkoxyamines having .gtoreq.1 amine group and groups with mol. wt. >15 in the .beta.-position to the N, such as triazine deriv. I.

ST multimodal polymer radical manuf alkoxyamine

IT Amines, uses  
 RL: CAT (Catalyst use); USES (Uses)  
 (N-alkoxy-; multimodal polymers by controlled radical polymn. in presence of alkoxyamines)

IT Polymerization catalysts  
 (multimodal polymers by controlled radical polymn. in presence of alkoxyamines)

IT Amines, uses  
 RL: CAT (Catalyst use); USES (Uses)  
 (polyamines, nonpolymeric, N-alkoxy-; multimodal polymers by controlled radical polymn. in presence of alkoxyamines)

IT Polymerization  
 (radical; multimodal polymers by controlled radical polymn. in presence of alkoxyamines)

IT 78-67-1, Azobisisobutyronitrile 300811-93-2 300811-94-3  
 300811-95-4 364731-73-7  
 RL: CAT (Catalyst use); USES (Uses)

(multimodal polymers by controlled radical polymn. in presence of alkoxyamines)

IT 9003-49-0P, Polybutyl **acrylate** 9003-53-6P, Polystyrene 25767-47-9P, Butyl **acrylate**-styrene copolymer

RL: IMF (Industrial manufacture); PREP (Preparation)

(multimodal polymers by controlled radical **polymn.** in presence of alkoxyamines)

RE.CNT 7 THERE ARE 7 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE

(1) Atochem Elf Sa; EP 0992514 A 2000 HCAPLUS

(2) Ciba Sc Holding Ag; WO 0037508 A 2000 HCAPLUS

(3) Commw Scient Ind Res Org; EP 0135280 A 1985 HCAPLUS

(4) Hope, P; WO 9813392 A 1998 HCAPLUS

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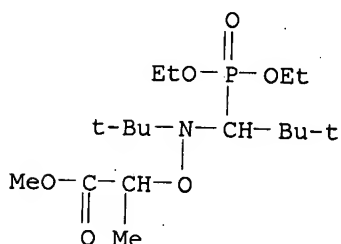
IT 300811-93-2 300811-94-3

RL: **CAT (Catalyst use)**; USES (Uses)

(multimodal polymers by controlled radical polymn. in presence of alkoxyamines)

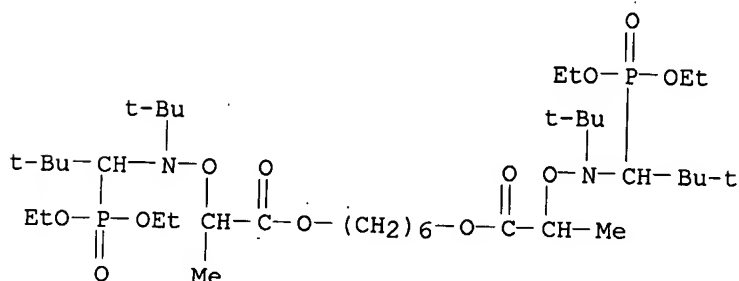
RN 300811-93-2 HCAPLUS

CN 3,7-Dioxa-4-aza-6-phosphanonanoic acid, 4,5-bis(1,1-dimethylethyl)-6-ethoxy-2-methyl-, methyl ester, 6-oxide (9CI) (CA INDEX NAME)



RN 300811-94-3 HCAPLUS

CN 3,7-Dioxa-4-aza-6-phosphanonanoic acid, 4,5-bis(1,1-dimethylethyl)-6-ethoxy-2-methyl-, 1,6-hexanediyl ester, 6,6'-dioxide (9CI) (CA INDEX NAME)



L32 ANSWER 30 OF 59 HCAPLUS COPYRIGHT 2003 ACS

AN 2001:167188 HCAPLUS

DN 134:340746

- TI The persistent radical effect in nitroxide mediated polymerization: experimental validity
- AU Lutz, Jean-Francois; Lacroix-Desmazes, Patrick; Boutevin, Bernard .
- CS Laboratoire de Chimie Macromoleculaire UMR-CNRS 5076, Ecole Nationale Supérieure de Chimie de Montpellier 8, Montpellier, 34296, Fr.
- SO Macromolecular Rapid Communications (2001), 22(3), 189-193  
CODEN: MRCOE3; ISSN: 1022-1336
- PB Wiley-VCH Verlag GmbH
- DT Journal
- LA English
- CC 35-3 (Chemistry of Synthetic High Polymers)
- AB The **free-radical polymn.** of styrene has been studied at 123.degree.C in the presence of a betaphosphonylated alkoxyamine (diethyl[(1,1-dimethylethyl)(1-phenylethoxy)amino]-2,2-dimethylpropyl phosphonate) (styryl-DEPN). The persistent radical effect is undoubtedly obsd. exptl. until the effect of viscosity on the rate const. of termination is no longer negligible. The kinetic laws of the persistent radical effect allow us to calc. the pseudo equil. const. of dissocn./combination between dormant and active species Kpolystyryl-DEPN = 6.1 .times. 10<sup>-9</sup> mol .cntdot. L<sup>-1</sup> at 123.degree.C. We have verified the reliability of this const. by computer simulation in comparison with the exptl. data.
- ST radical effect nitroxide mediated polymn styrene modeling
- IT Simulation and Modeling, physicochemical  
Viscosity  
(exptl. validity of persistent radical effect in nitroxide mediated polymn.)
- IT Polymerization kinetics  
(radical; exptl. validity of persistent radical effect in nitroxide mediated polymn.)
- IT 100-42-5, Styrene, reactions **224575-62-6**  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(exptl. validity of persistent radical effect in nitroxide mediated polymn.)
- IT 9003-53-6P, Polystyrene  
RL: SPN (Synthetic preparation); PREP (Preparation)  
(exptl. validity of persistent radical effect in nitroxide mediated polymn.)
- RE.CNT 29 THERE ARE 29 CITED REFERENCES AVAILABLE FOR THIS RECORD
- RE
- (1) Benoit, D; ACS Symp Series 685 1998, P225 HCAPLUS
  - (2) Benoit, D; J Am Chem Soc 2000, V122, P5929 HCAPLUS
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  - (4) Buback, M; Macromol Chem Phys 1995, V196, P3267 HCAPLUS
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  - (6) Fischer, H; J Am Chem Soc 1986, V108, P3925 HCAPLUS
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  - (8) Fischer, H; Macromolecules 1997, V30, P5666 HCAPLUS
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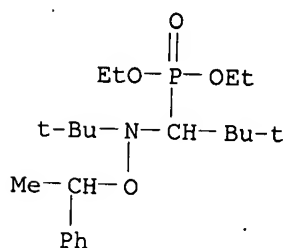
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- (20) Le Mercier, C; Polym Prepr 1999, V40(2), P403 HCAPLUS
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- (24) O'Driscoll, K; Kinetics of Bimolecular Termination 1989, V3, P161
- (25) Piton, M; Macromolecules 1993, V26, P4472 HCAPLUS
- (26) Ruegge, D; Int J Chem Kinet 1989, V21, P703
- (27) Shipp, D; Macromolecules 1999, V32, P2948 HCAPLUS
- (28) Walbiner, M; Helv Chim Acta 1995, V78, P910 HCAPLUS
- (29) Yamada, B; Macromolecules 1991, V24, P5234 HCAPLUS

IT 224575-62-6

RL: RCT (Reactant); RACT (Reactant or reagent)  
(exptl. validity of persistent radical effect in nitroxide mediated polymn.)

RN 224575-62-6 HCAPLUS

CN Phosphonic acid, [1-[(1,1-dimethylethyl)(1-phenylethoxy)amino]-2,2-dimethylpropyl]-, diethyl ester (9CI) (CA INDEX NAME)



- L32 ANSWER 31 OF 59 HCAPLUS COPYRIGHT 2003 ACS
- AN 2001:76188 HCAPLUS
- DN 134:318488
- TI Cross termination rate constants of alkyl radicals with nitroxides - a key step in living radical polymerization
- AU Sobek, J.; Martschke, R.; Fischer, H.
- CS Institute of Physical Chemistry, University of Zurich, Zurich, 8057, Switz.
- SO Journal of Information Recording (2000), 25(3-4), 455-463  
CODEN: JIREFL; ISSN: 1025-6008
- PB Gordon & Breach Science Publishers
- DT Journal
- LA English
- CC 74-1 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)  
Section cross-reference(s): 35
- AB In search of improved initiators for the living **free radical polymn.** mediated by nitroxides, a complete description of the individual processes is required. The kinetics is rather complex, in particular the rate consts. of cross termination are crucial since they greatly influence the course of the reaction. Therefore, the authors investigated the reaction rate consts. of a wide variety of C-centered radicals with various nitroxides. The authors present and discuss the temp. dependence of rate consts. for the reaction between acetic- and isobutyric acid ester radicals and various nitroxides obtained by laser flash photolysis measurements.

ST photolysis study reaction kinetics alkyl radical nitroxide;  
methoxycarbonylmethyl radical nitroxide reaction kinetics flash  
photolysis; isobutyric acid ester radical nitroxide reaction kinetics  
flash photolysis

IT Photolysis kinetics  
Reaction kinetics  
(flash photolysis study of temp. dependence of rate consts. for  
reaction between alkyl radicals and nitroxides)

IT Nitroxides  
RL: PRP (Properties); RCT (Reactant); RACT (Reactant or reagent)  
(flash photolysis study of temp. dependence of rate consts. for  
reaction between alkyl radicals and nitroxides)

IT Polymerization catalysts  
(flash photolysis study of temp. dependence of rate consts. for  
reaction between alkyl radicals and nitroxides in relation to)

IT Polymerization kinetics  
(living, free radical; flash photolysis study of  
temp. dependence of rate consts. for reaction between alkyl radicals  
and nitroxides in relation to)

IT 2406-25-9 2564-83-2 2887-41-4, 2-Methoxycarbonyl-2-propyl radical  
22104-03-6 54668-31-4, (Methoxycarbonyl)methyl 61015-94-9  
188526-94-5  
RL: PRP (Properties); RCT (Reactant); RACT (Reactant or reagent)  
(flash photolysis study of temp. dependence of rate consts. for  
reaction between alkyl radicals and nitroxides)

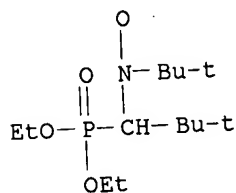
IT 10472-32-9, 2,2',4,4'-Tetramethyldimethylacetonedicarboxylate  
53544-93-7, 2,2,5,5-Tetramethyl-4-phenyl-3-azahexane-3-oxyl  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(flash photolysis study of temp. dependence of rate consts. for  
reaction between alkyl radicals and nitroxides)

RE.CNT 17 THERE ARE 17 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE  
(1) Benoit, D; J Am Chem Soc 1999, V121, P3904 HCAPLUS  
(2) Bowry, V; J Am Chem Soc 1992, V114, P4992 HCAPLUS  
(3) Fischer, H; J Polym Sci Part A: Polym Chem 1999, V37, P1885 HCAPLUS  
(4) Fischer, H; Macromol 1997, V30, P5666 HCAPLUS  
(5) Frechet, J; Science 1994, V263, P1710 HCAPLUS  
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(17) Webster, O; Science 1991, V251, P887 HCAPLUS

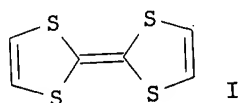
IT 188526-94-5  
RL: PRP (Properties); RCT (Reactant); RACT (Reactant or reagent)  
(flash photolysis study of temp. dependence of rate consts. for  
reaction between alkyl radicals and nitroxides)

RN 188526-94-5 HCAPLUS  
CN Nitroxide, 1-(diethoxyphosphinyl)-2,2-dimethylpropyl 1,1-dimethylethyl  
(9CI) (CA INDEX NAME)



L32 ANSWER 32 OF 59 HCAPLUS COPYRIGHT 2003 ACS  
 AN 2001:44475 HCAPLUS  
 DN 134:72036  
 TI Controlled-radical polymerization or copolymerization process  
 IN Robin, Sophie; Gnanou, Yves  
 PA Elf Atochem S.A., Fr.  
 SO Fr. Demande, 42 pp.  
 CODEN: FRXXBL  
 DT Patent  
 LA French  
 IC ICM C08F004-00  
 ICS C08F020-18  
 CC 35-3 (Chemistry of Synthetic High Polymers)  
 Section cross-reference(s): 67

| FAN.CNT 1 | PATENT NO.       | KIND | DATE     | APPLICATION NO. | DATE     |
|-----------|------------------|------|----------|-----------------|----------|
| PI        | FR 2791687       | A1   | 20001006 | FR 1999-4031    | 19990331 |
| PRAI      | FR 1999-4031     |      | 19990331 |                 |          |
| OS        | MARPAT 134:72036 |      |          |                 |          |
| GI        |                  |      |          |                 |          |



AB Monomers are **polymd.** in the presence of stable **free radicals** (e.g., nitroxides), electron donors, and optionally, electron acceptors, where the ratio of electron donors to electron acceptors is >1. Me **methacrylate** was **polymd.** in the presence of (C<sub>2</sub>H<sub>5</sub>O)<sub>2</sub>P(:O)C(tert-Bu)N(tert-Bu)O. and I.

ST stable **free radical polymn**; methyl **methacrylate polymn** nitroxide electron donor

IT Electron donors  
 (controlled-radical polymn. or copolymn. process)

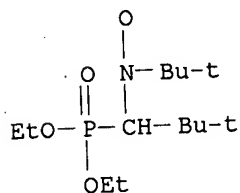
IT Nitroxides  
 RL: CAT (Catalyst use); USES (Uses)  
 (controlled-radical polymn. or copolymn. process)

IT Polymerization  
 (radical; controlled-radical polymn. or copolymn. process)

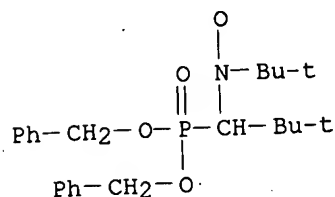
IT 2154-68-9, 3-Carboxy-2,2,5,5-tetramethyl-pyrrolidinyloxy 2226-96-2,  
 4-Hydroxy-2,2,6,6-tetramethyl-1-piperidinyloxy 2516-92-9 2525-39-5,  
 2,4,6-Tri-tert-butylphenoxy 2564-83-2, 2,2,6,6-Tetramethyl-1-  
 piperidinyloxy 2896-70-0, 4-Oxo-2,2,6,6-tetramethyl-1-piperidinyloxy



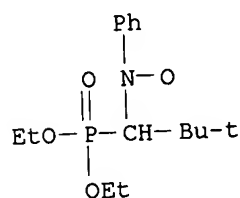
- 3229-53-6, 2,2,5,5 Tetramethyl-1-pyrrolidinyloxy 22690-04-6 31366-25-3  
 61015-94-9 64793-59-5 95407-69-5, 4-Methoxy-2,2,6,6-tetramethyl-1-  
 piperidinyloxy **188526-94-5**, N-tert-Butyl-1-diethylphosphono-2,2-  
 dimethyl propylnitroxide **188707-72-4**, N-Tert-Butyl-1-  
 dibenzylphosphono-2,2-dimethyl propyl nitroxide 200345-02-4  
**200345-03-5**, N-Phenyl-1-diethylphosphono-2,2-dimethyl  
 propylnitroxide 200345-04-6, N-Phenyl-1-diethylphosphono-1-methyl ethyl  
 nitroxide **200345-05-7**, N-(1-Phenyl 2-methyl propyl)-1-  
 diethylphosphono-1-methyl ethyl nitroxide **258354-63-1**,  
 N-Tert-Butyl-[(1-diethylphosphono)-2-methyl-propyl]nitroxide  
**261527-17-7**, N-tert-Butyl-1-di(2,2,2-trifluoroethyl)phosphono-2,2-  
 dimethyl propyl nitroxide **263355-91-5** **302906-69-0**,  
 N-(1-Phenylbenzyl)-[(1-diethylphosphono)-1-methylethyl] nitroxide  
 RL: **CAT (Catalyst use)**; USES (Uses)  
 (controlled-radical polymn. or copolymn. process)  
 IT 9011-14-7P, Methyl **methacrylate** homopolymer  
 RL: IMF (Industrial manufacture); PREP (Preparation)  
 (controlled-radical **polymn.** or copolymn. process)  
 IT **188526-94-5**, N-tert-Butyl-1-diethylphosphono-2,2-dimethyl  
 propylnitroxide **188707-72-4**, N-Tert-Butyl-1-dibenzylphosphono-  
 2,2-dimethyl propyl nitroxide **200345-03-5**, N-Phenyl-1-  
 diethylphosphono-2,2-dimethyl propylnitroxide **200345-05-7**,  
 N-(1-Phenyl 2-methyl propyl)-1-diethylphosphono-1-methyl ethyl nitroxide  
**258354-63-1**, N-Tert-Butyl-[(1-diethylphosphono)-2-methyl-  
 propyl]nitroxide **261527-17-7**, N-tert-Butyl-1-di(2,2,2-  
 trifluoroethyl)phosphono-2,2-dimethyl propyl nitroxide **263355-91-5**  
**302906-69-0**, N-(1-Phenylbenzyl)-[(1-diethylphosphono)-1-  
 methylethyl] nitroxide  
 RL: **CAT (Catalyst use)**; USES (Uses)  
 (controlled-radical polymn. or copolymn. process)  
 RN 188526-94-5 HCAPLUS  
 CN Nitroxide, 1-(diethoxyphosphinyl)-2,2-dimethylpropyl 1,1-dimethylethyl  
 (9CI) (CA INDEX NAME)



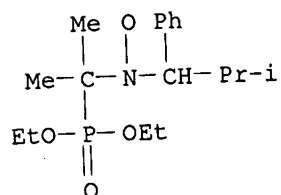
- RN 188707-72-4 HCAPLUS  
 CN Nitroxide, 1-[bis(phenylmethoxy)phosphinyl]-2,2-dimethylpropyl  
 1,1-dimethylethyl (9CI) (CA INDEX NAME)



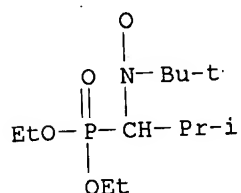
RN 200345-03-5 HCAPLUS  
 CN Nitroxide, 1-(diethoxyphosphinyl)-2,2-dimethylpropyl phenyl (9CI) (CA INDEX NAME)



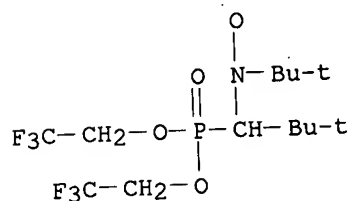
RN 200345-05-7 HCAPLUS  
 CN Nitroxide, 1-(diethoxyphosphinyl)-1-methylethyl 2-methyl-1-phenylpropyl (9CI) (CA INDEX NAME)



RN 258354-63-1 HCAPLUS  
 CN Nitroxide, 1-(diethoxyphosphinyl)-2-methylpropyl 1,1-dimethylethyl (9CI) (CA INDEX NAME)

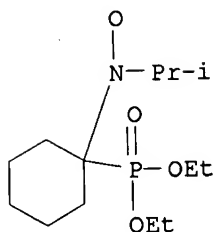


RN 261527-17-7 HCAPLUS  
 CN Nitroxide, 1-[bis(2,2,2-trifluoroethoxy)phosphinyl]-2,2-dimethylpropyl 1,1-dimethylethyl (9CI) (CA INDEX NAME)

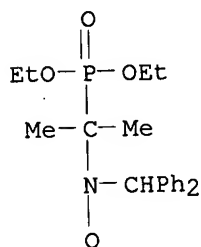


RN 263355-91-5 HCAPLUS  
 CN Nitroxide, 1-(diethoxyphosphinyl)cyclohexyl 1-methylethyl (9CI) (CA INDEX NAME)

NAME)



RN 302906-69-0 HCAPLUS  
 CN Nitroxide, 1-(diethoxyphosphinyl)-1-methylethyl diphenylmethyl (9CI) (CA  
 INDEX NAME)



L32 ANSWER 33 OF 59 HCAPLUS COPYRIGHT 2003 ACS  
 AN 2001:31452 HCAPLUS  
 DN 134:101275  
 TI Preparation of mono and multifunctional alkoxyamines for forming nitroxyl  
 radical **initiators** and regulators useful in the preparation of  
 polymers with narrow polydispersity  
 IN Kramer, Andreas; Nesvadba, Peter; Zink, Marie-Odile; Wunderlich, Wiebke  
 PA Ciba Specialty Chemicals Holding Inc., Switz.  
 SO PCT Int. Appl., 74 pp.  
 CODEN: PIXXD2  
 DT Patent  
 LA English  
 IC ICM C07C239-20  
 ICS C07D211-94; C08F004-00  
 CC 35-3 (Chemistry of Synthetic High **Polymers**)  
 FAN.CNT 1

|     | PATENT NO.  | KIND | DATE     | APPLICATION NO. | DATE     |
|-----|---|------|----------|-----------------|----------|
| PI  | WO 2001002345   | A2   | 20010111 | WO 2000-EP5899  | 20000626 |
|     | WO 2001002345   | A3   | 20010719 |                 |          |
| W:  | AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR,<br>CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU,<br>ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU,<br>LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD,<br>SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU,<br>ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM |      |          |                 |          |
| RW: | GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY,<br>DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ,  |      |          |                 |          |

CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG  
 EP 1189875 A2 20020327 EP 2000-951302 20000626  
 R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, MC, PT, IE,  
 SI, LT, LV, FI, RO  
 JP 2003503474 T2 20030128 JP 2001-507787 20000626  
 PRAI EP 1999-810567 A 19990702  
 WO 2000-EP5899 W 20000626  
 OS MARPAT 134:101275  
 AB The title alkoxyamines esp. useful for the living **polymn.** of  
 unsatd. monomers or/and oligomers giving polymers with good conversion are  
 compds. bearing groups which can liberate stable **free** nitroxyl  
**radicals** of specific structures.  
 ST alkoxyamine multifunctional nitroxyl **initiator** radical living  
 polymn; narrow polydispersity radical living polymn; mol wt distribution  
 living polymn nitroxyl radical **initiator**  
 IT Amines, preparation  
 RL: CAT (Catalyst use); IMF (Industrial manufacture); PREP (Preparation);  
 USES (Uses)  
 (alkoxylated, derivs., **initiator**; prepn. of mono and  
 multifunctional alkoxyamines as **initiators** for **free**  
**radical polymn.** with narrow polydispersity)  
 IT **Polymerization**  
 (living, radical; prepn. of mono and multifunctional alkoxyamines as  
**initiators** for **free radical polymn**  
 . with narrow polydispersity)  
 IT **Polymerization** catalysts  
 (living; prepn. of mono and multifunctional alkoxyamines as  
**initiators** for **free radical polymn**  
 . with narrow polydispersity)  
 IT Nitroxides  
 RL: CAT (Catalyst use); IMF (Industrial manufacture); PREP (Preparation);  
 USES (Uses)  
 (prepn. of mono and multifunctional alkoxyamines as **initiators**  
 for **free radical polymn.** with narrow  
 polydispersity)  
 IT **Polymerization** catalysts  
 (radical; prepn. of mono and multifunctional alkoxyamines as  
**initiators** for **free radical polymn**  
 . with narrow polydispersity)  
 IT 243972-13-6P 243972-14-7P 243972-16-9P 264280-52-6P 319457-95-9P  
 319457-96-0P 319457-97-1P 319458-04-3P 319458-08-7P 319458-11-2P  
 319458-12-3P 319458-15-6P 319458-16-7P 319458-17-8P 319458-25-8P  
 319458-26-9P 319458-28-1P 319458-30-5P 319458-31-6P 319458-33-8P  
 319458-35-0P 319458-36-1P 319458-38-3P 319458-39-4P 319458-41-8P  
 319458-42-9P 319458-44-1P 319458-45-2P 319458-47-4P 319458-48-5P  
 319458-50-9P 319458-52-1P 319458-53-2P  
 RL: CAT (Catalyst use); IMF (Industrial manufacture); RCT  
 (Reactant); PREP (Preparation); RACT (Reactant or reagent); USES (Uses)  
 (**initiator**/intermediate for multifunctional **initiator**  
 ; prepn. of mono and multifunctional alkoxyamines as **initiators**  
 for **free radical polymn.** with narrow  
 polydispersity)  
 IT 264280-51-5P 319457-98-2P 319457-99-3P 319458-00-9P 319458-01-0P  
 319458-02-1P 319458-03-2P 319458-05-4P 319458-06-5P 319458-07-6P  
 319458-09-8P 319458-10-1P 319458-13-4P 319458-14-5P 319458-18-9P  
 319458-19-0P 319458-20-3P 319458-21-4P 319458-22-5P 319458-23-6P  
 319458-24-7P 319458-27-0P 319458-29-2P 319458-32-7P 319458-34-9P  
 319458-37-2P 319458-40-7P 319458-43-0P 319458-46-3P 319458-49-6P

319458-51-0P 319458-54-3P

RL: CAT (Catalyst use); IMF (Industrial manufacture); PREP (Preparation); USES (Uses)

(initiator; prepn. of mono and multifunctional alkoxyamines as initiators for free radical polymn. with narrow polydispersity)

IT 9003-49-0P, Butyl acrylate homopolymer 9003-53-6P, Polystyrene

RL: IMF (Industrial manufacture); PREP (Preparation)

(linear or star-shaped; prepn. of mono and multifunctional alkoxyamines as initiators for free radical polymn. with narrow polydispersity)

IT 106-95-6, Allyl bromide, reactions 108-77-0, Cyanuric chloride  
 115-77-5, Pentaerythritol, reactions 535-11-5, Ethyl 2-bromopropionate  
 623-24-5, .alpha.,.alpha.'-Dibromo-p-xylene 814-68-6, Acryloyl  
 chloride 937-30-4 2226-96-2, 4-Hydroxy-2,2,6,6-tetramethylpiperidin-1-  
 oxyl 3095-73-6, Hexakis(bromomethyl)benzene 3245-23-6, 4-Ethylphenyl  
 acetate 5675-51-4, 1,12-Dodecanediol 15442-91-8, 1,2,4,5-  
 Tetrakis(bromomethyl)benzene 20248-86-6, 4,4'-Bis(bromomethyl)biphenyl  
 61745-37-7 264279-93-8

RL: RCT (Reactant); RACT (Reactant or reagent)

(reactant for initiator; prepn. of mono and multifunctional alkoxyamines as initiators for free radical polymn. with narrow polydispersity)

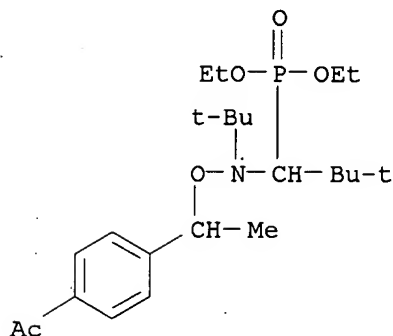
IT 319458-52-1P 319458-53-2P

RL: CAT (Catalyst use); IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent); USES (Uses)

(initiator/intermediate for multifunctional initiator; prepn. of mono and multifunctional alkoxyamines as initiators for free radical polymn. with narrow polydispersity)

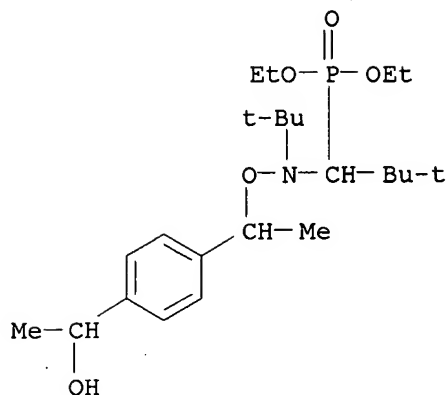
RN 319458-52-1 HCAPLUS

CN Phosphonic acid, [1-[[1-(4-acetylphenyl)ethoxy](1,1-dimethylethyl)amino]-2,2-dimethylpropyl]-, diethyl ester (9CI) (CA INDEX NAME)



RN 319458-53-2 HCAPLUS

CN Phosphonic acid, [1-[(1,1-dimethylethyl)[1-[4-(1-hydroxyethyl)phenyl]ethoxy]amino]-2,2-dimethylpropyl]-, diethyl ester (9CI) (CA INDEX NAME)



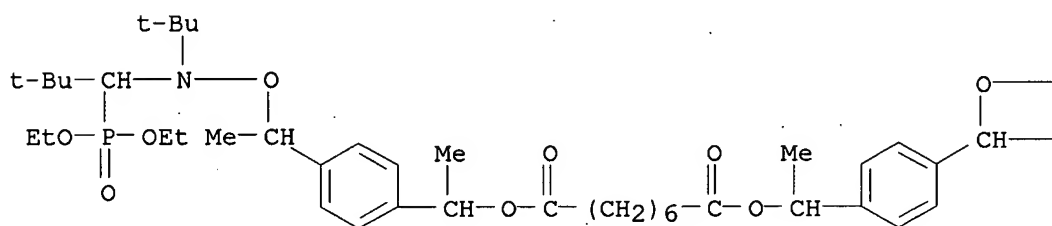
IT 319458-54-3P

RL: **CAT (Catalyst use)**; IMF (Industrial manufacture); PREP  
(Preparation); USES (Uses)  
(initiator; prepn. of mono and multifunctional alkoxyamines  
as initiators for **free radical**  
**polymn.** with narrow polydispersity)

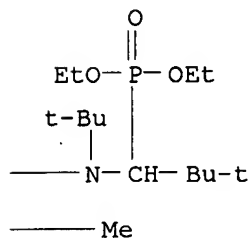
RN 319458-54-3 HCAPLUS

CN Octanedioic acid, bis[1-[4-[3,4-bis(1,1-dimethylethyl)-5-ethoxy-1-methyl-5-oxido-2,6-dioxa-3-aza-5-phosphaoct-1-yl]phenyl]ethyl] ester (9CI) (CA INDEX NAME)

PAGE 1-A



PAGE 1-B



- L32 ANSWER 34 OF 59 HCAPLUS COPYRIGHT 2003 ACS  
 AN 2000:882384 HCAPLUS  
 DN 134:178862  
 TI End-group fidelity in nitroxide-mediated living **free-radical polymerizations**  
 AU Rodlert, Marlene; Harth, Eva; Rees, Ian; Hawker, Craig J.  
 CS IBM Almaden Research Center, San Jose, CA, 95120-6099, USA  
 SO Journal of Polymer Science, Part A: Polymer Chemistry (2000), 38(Suppl.), 4749-4763  
 CODEN: JPACEC; ISSN: 0887-624X  
 PB John Wiley & Sons, Inc.  
 DT Journal  
 LA English  
 CC 35-3 (Chemistry of Synthetic High Polymers)  
 AB New nitroxides based on the 2,2,5-trimethyl-4-phenyl-3-azahexane-3-oxy skeleton were used to examine chain-end control during the prepn. of polystyrene and poly(t-Bu **acrylate**) under living **free-radical** conditions. Alkoxyamine-based **initiators** with a chromophore attached to either the **initiating** fragment or the mediating nitroxide fragment were prepd., and the extent of the incorporation of the chromophores at either the **initiating** end or the propagating chain end was detd. In contrast to 2,2,6,6-tetra-Me piperidinoxy (TEMPO), the incorporation of the **initiating** and terminating fragment into the polymer chain was extremely high. For both poly(t-Bu **acrylate**) and polystyrene with mol. wts. less than or equal to 70,000, incorporations at the **initiating** end of greater than 97% were obsd. At the terminating chain end, incorporations of greater than 95% were obtained for mol. wts. less than or equal to 50,000. The level of incorporation tended to decrease slightly at higher mol. wts. because of the loss of the alkoxyamine propagating unit, which had important consequences for block copolymer formation. These results clearly show that these new .alpha.-H nitroxides could control the **polymn.** of vinyl monomers such as styrene and t-Bu **acrylate** to an extremely high degree, comparable to anionic and atom transfer radical **polymn.** procedures.  
 ST phenylazahexanoxy catalyst living **polymn** styrene **acrylate**; polystyrene prepn living **polymn** phenylazahexanoxy; polybutyl **acrylate** prepn living **polymn** phenylazahexanoxy; alkoxyamine **polymn** catalyst styrene **acrylate**  
 IT **Polymerization** catalysts  
 (living, radical; prepn. of polystyrene and poly(tert-Bu **acrylate**) in presence of nitroxide based on trimethylphenylazahexanoxy skeleton)  
 IT 326474-17-3P **326474-18-4P** 326474-24-2P  
 RL: CAT (**Catalyst use**); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)  
 (catalysts; prepn. as catalysts for **polymn.** of styrene and tert-Bu **acrylate**)  
 IT 326474-20-8P **326474-26-4P**  
 RL: SPN (Synthetic preparation); PREP (Preparation)  
 (prepn. and characterization of)  
 IT 326474-22-0P  
 RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)  
 (prepn. and hydrolysis of)  
 IT 293328-23-1P 326474-25-3P  
 RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT

- (Reactant or reagent)  
(prepn. and reaction with dansyl chloride)
- IT 17100-68-4P  
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)  
(prepn. and reaction with magnesium)
- IT 326474-23-1P  
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)  
(prepn. and reaction with pyrenebutyric acid)
- IT 326474-19-5P 326474-21-9P  
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)  
(prepn. and reaction with styrene)
- IT 9003-53-6P, Polystyrene 25232-27-3P, Poly(tert-butyl acrylate)  
RL: SPN (Synthetic preparation); PREP (Preparation)  
(prepn. in presence of nitroxide based on trimethylphenylazahexanoxy skeleton)
- IT 85664-55-7  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(reaction with (tetrahydropyranoxy)phenylmagnesium bromide)
- IT 605-65-2, Dansyl chloride  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(reaction with aminomethyl-contg. phenylazahexane deriv.)
- IT 25338-56-1, Pyrenebutyric acid  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(reaction with azahexane deriv.)
- IT 110-87-2, 3,4-Dihydro-2H-pyran  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(reaction with bromobenzyl alc.)
- IT 194785-98-3, 4-Pyrenebutanol  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(reaction with chloromethyl alkoxyamine deriv.)
- IT 873-75-6, 4-Bromobenzyl alcohol  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(reaction with dihydropyran)
- IT 36637-44-2 195388-58-0  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(reaction with nitron deriv.)
- IT 227000-85-3  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(reaction with pyrenebutanol)
- IT 100-42-5, Styrene, reactions  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(reaction with trimethyl(tetrahydropyranyl)phenylazahexanenitroxide)

RE.CNT 57 THERE ARE 57 CITED REFERENCES AVAILABLE FOR THIS RECORD  
RE

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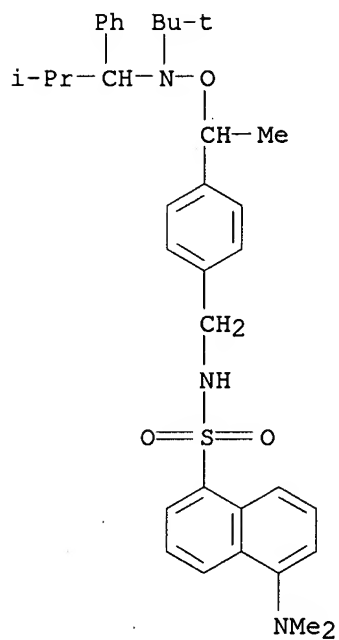
IT 326474-18-4P

RL: CAT (Catalyst use); SPN (Synthetic preparation); PREP  
(Preparation); USES (Uses)

(catalysts; prepn. as catalysts for polymn. of styrene and  
tert-Bu acrylate)

RN 326474-18-4 HCAPLUS

CN 1-Naphthalenesulfonamide, 5-(dimethylamino)-N-[[4-[1-[[[(1,1-dimethylethyl)(2-methyl-1-phenylpropyl)amino]oxy]ethyl]phenyl]methyl]-  
(9CI) (CA INDEX NAME)



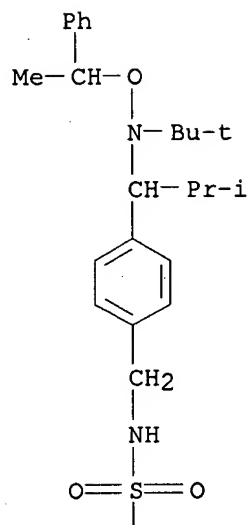
IT 326474-26-4P

RL: SPN (Synthetic preparation); PREP (Preparation)  
(prepn. and characterization of)

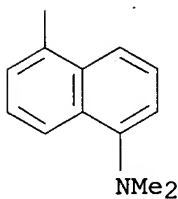
RN 326474-26-4 HCAPLUS

CN 1-Naphthalenesulfonamide, 5-(dimethylamino)-N-[[4-[1-[(1,1-dimethylethyl)(1-phenylethoxy)amino]-2-methylpropyl]phenyl]methyl]- (9CI)  
(CA INDEX NAME)

PAGE 1-A



PAGE 2-A



L32 ANSWER 35 OF 59 HCAPLUS COPYRIGHT 2003 ACS  
AN 2000:842098 HCAPLUS  
DN 134:29789  
TI Alkoxyamine phosphonates and their use as polymerization catalysts  
IN Guerret, Olivier; Couturier, Jean-Luc; Lutz, Jean-Francois; Le Mercier, Christophe; Robin, Sophie; Vuillemin, Bruno  
PA Atofina, Fr.  
SO PCT Int. Appl., 59 pp.  
CODEN: PIXXD2  
DT Patent  
LA French  
IC ICM C07C239-20  
ICS C07F009-40; C07D251-32; C08F004-00  
CC 35-3 (Chemistry of Synthetic High Polymers)  
Section cross-reference(s): 29  
FAN.CNT 1  
PATENT NO. KIND DATE APPLICATION NO. DATE

PI WO 2000071501 A1 20001130 WO 2000-FR1287 20000512  
 W: AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU,  
 CZ, DE, DK, DM, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL,  
 IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA,  
 MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI,  
 SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW, AM,  
 AZ, BY, KG, KZ, MD, RU, TJ, TM  
 RW: GH, GM, KE, LS, MW, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY, DE,  
 DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF,  
 CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG  
 FR 2794459 A1 20001208 FR 1999-6329 19990519  
 EP 1178955 A1 20020213 EP 2000-929608 20000512  
 R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT,  
 IE, SI, LT, LV, FI, RO  
 JP 2003500378 T2 20030107 JP 2000-619758 20000512  
 PRAI FR 1999-6329 A 19990519  
 WO 2000-FR1287 W 20000512  
 AB Alkoxyamine phosphonates contg. 2-3 alkoxyamine groups are obtained from  
 .beta.-substituted nitroxides such as di-Et 2,2-dimethyl-1-(tert-  
 butylamino)propylphosphonate N-oxide (I) and are suitable for application  
 as radical **polymn.** catalysts with good control. The inventive  
 compds. can be used as **initiators** for (co)polymns. of at least  
 one radically **polymerizable** monomer. Thus, I was condensed  
 (2:1) with the Br groups in 1,6-hexanediol bis(2-bromopropionate) to give  
 a bis(alkoxyamine phosphonate) which could be used to homopolymerize  
 styrene or block copolymerize styrene with Bu **acrylate**.  
 ST phosphonate alkoxyamine prodn radical polymn catalyst; nitroxide  
 condensation org halide alkoxyamine prodn  
 IT Polymerization catalysts  
 (radical; prodn. of alkoxyamine phosphonates for use as)  
 IT 9003-49-OP, Poly(butyl **acrylate**) 9003-53-6P, Polystyrene  
 25767-47-9P, Butyl **acrylate**-styrene copolymer  
 RL: IMF (Industrial manufacture); PREP (Preparation)  
 (alkoxyamine phosphonates as radical **polymn.** catalysts for  
 prodn. of)  
 IT 3030-47-5, PMDETA 7440-50-8, Copper, uses 7787-70-4, Cuprous bromide  
 16858-01-8, Tris(2-pyridylmethyl)amine 37275-48-2, Bipyridine  
 RL: CAT (Catalyst use); USES (Uses)  
 (in prodn. of alkoxyamine phosphonates for use as radical **polymn.**  
 catalysts)  
 IT 310878-87-6  
 RL: RCT (Reactant); RACT (Reactant or reagent)  
 (intermediate; prodn. of alkoxyamine phosphonates for use as radical  
**polymn.** catalysts)  
 IT 300811-94-3P 300811-95-4P 310878-79-6P  
 310878-80-9P 310878-81-0P 310878-82-1P  
 310878-83-2P  
 RL: CAT (Catalyst use); IMF (Industrial manufacture); PREP  
 (Preparation); USES (Uses)  
 (prodn. of alkoxyamine phosphonates for use as radical **polymn.**  
 catalysts)  
 IT 563-76-8, 2-Bromopropionyl bromide 839-90-7, 1,3,5-Tris(2-  
 hydroxyethyl)cyanuric acid 17194-87-5, p-Bis(1-bromoethyl)benzene  
 52255-99-9 188526-94-5 310878-84-3, 1,6-Hexanediol  
 bis(2-bromopropionate) 310878-85-4 310878-86-5 310878-88-7  
 RL: RCT (Reactant); RACT (Reactant or reagent)  
 (starting material; prodn. of alkoxyamine phosphonates for use as

radical polymn. catalysts)

IT 110772-34-4P, Butyl **acrylate**-styrene block copolymer  
 RL: IMF (Industrial manufacture); PREP (Preparation)  
 (triblock; alkoxyamine phosphonates as radical **polymn.**  
 catalysts for prodn. of)

RE.CNT 5 THERE ARE 5 CITED REFERENCES AVAILABLE FOR THIS RECORD

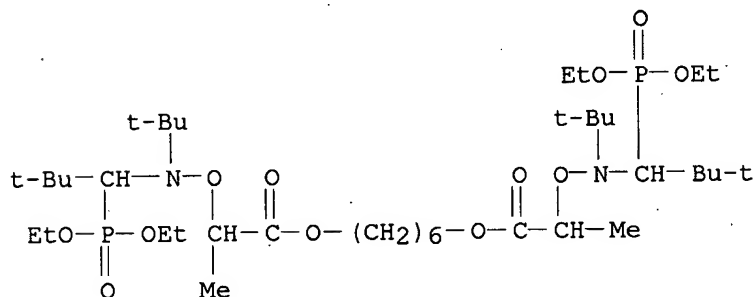
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IT 300811-94-3P 310878-79-6P 310878-80-9P  
 310878-81-0P 310878-82-1P 310878-83-2P  
 RL: CAT (Catalyst use); IMF (Industrial manufacture); PREP  
 (Preparation); USES (Uses)  
 (prodn. of alkoxyamine phosphonates for use as radical polymn.  
 catalysts)

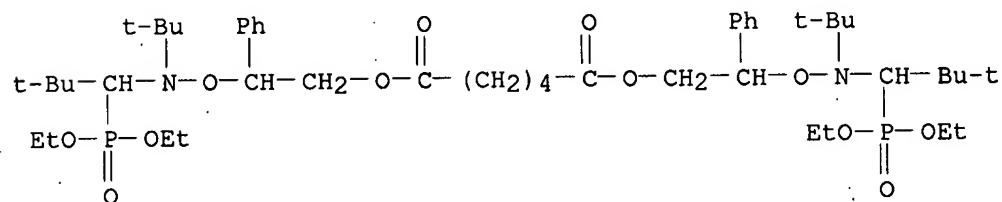
RN 300811-94-3 HCAPLUS

CN 3,7-Dioxa-4-aza-6-phosphanonanoic acid, 4,5-bis(1,1-dimethylethyl)-6-ethoxy-2-methyl-, 1,6-hexanediyl ester, 6,6'-dioxide (9CI) (CA INDEX NAME)



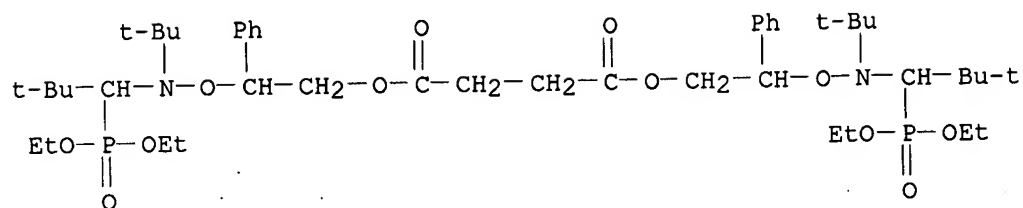
RN 310878-79-6 HCAPLUS

CN Hexanedioic acid, bis[4,5-bis(1,1-dimethylethyl)-6-ethoxy-6-oxido-2-phenyl-3,7-dioxa-4-aza-6-phosphanon-1-yl] ester (9CI) (CA INDEX NAME)

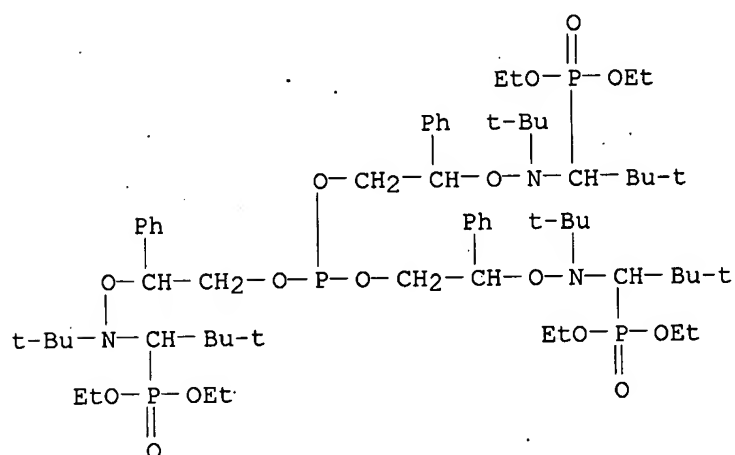


RN 310878-80-9 HCAPLUS

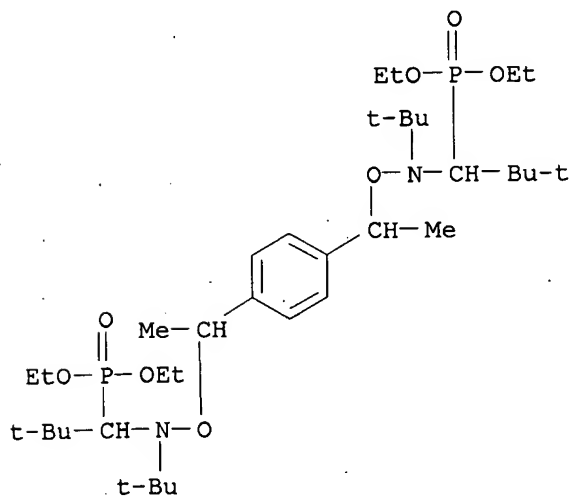
CN Butanedioic acid, bis[4,5-bis(1,1-dimethylethyl)-6-ethoxy-6-oxido-2-phenyl-3,7-dioxa-4-aza-6-phosphanon-1-yl] ester (9CI) (CA INDEX NAME)



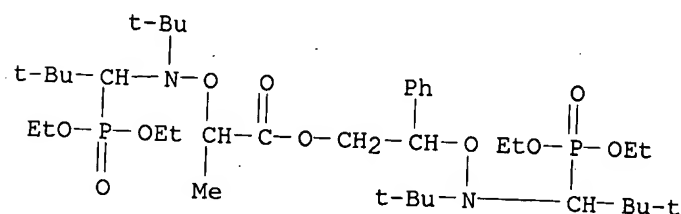
RN 310878-81-0 HCAPLUS  
 CN Phosphonic acid, [phosphinidynetris[oxy(1-phenyl-2,1-ethanediyl)oxy[(1,1-dimethylethyl)imino](2,2-dimethylpropylidene)]]tris-, hexaethyl ester  
 (9CI) (CA INDEX NAME)



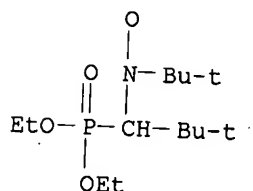
RN 310878-82-1 HCAPLUS  
 CN Phosphonic acid, [1,4-phenylenebis[ethylideneoxy[(1,1-dimethylethyl)imino](2,2-dimethylpropylidene)]]bis-, tetraethyl ester  
 (9CI) (CA INDEX NAME)



RN 310878-83-2 HCAPLUS  
 CN 3,7-Dioxa-4-aza-6-phosphanonanoic acid, 4,5-bis(1,1-dimethylethyl)-6-ethoxy-2-methyl-, 4,5-bis(1,1-dimethylethyl)-6-ethoxy-6-oxido-2-phenyl-3,7-dioxa-4-aza-6-phosphanon-1-yl ester, 6-oxide (9CI) (CA INDEX NAME)



IT 188526-94-5  
 RL: RCT (Reactant); RACT (Reactant or reagent)  
 (starting material; prodn. of alkoxyamine phosphonates for use as radical polymn. catalysts)  
 RN 188526-94-5 HCAPLUS  
 CN Nitroxide, 1-(diethoxyphosphinyl)-2,2-dimethylpropyl 1,1-dimethylethyl (9CI) (CA INDEX NAME)



L32 ANSWER 36 OF 59 HCAPLUS COPYRIGHT 2003 ACS  
 AN 2000:814527 HCAPLUS  
 DN 133:350716  
 TI Process for **polymerization** using unsymmetrically **free-radical initiators** to control type and degree of **polymerization** and unsymmetrically **free-radical initiators**  
 IN Matthews, Randall Stryker; Smith, Steven Daryl  
 PA The Procter & Gamble Co., USA  
 SO PCT Int. Appl., 33 pp.  
 CODEN: PIXXD2  
 DT Patent  
 LA English  
 IC ICM C08F004-04  
 ICS C08F002-06  
 CC 35-4 (Chemistry of Synthetic High Polymers)  
 FAN.CNT 1

| PATENT NO.   | KIND | DATE     | APPLICATION NO. | DATE     |
|--|------|----------|-----------------|----------|
| WO 2000068275  | A1   | 20001116 | WO 2000-US12700 | 20000509 |
| W: AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK, DM, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, |      |          |                 |          |

RO, RU, SD, SE, SG, SI, SK, SK, SL, TJ, TM, TR, TT, TZ, UA, UG,  
 US, UZ, VN, YU, ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM  
 RW: GH, GM, KE, LS, MW, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY, DE,  
 DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF,  
 CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG

PRAI US 1999-133338P P 19990510

AB The process for **initiating polymn.** comprises (a) reacting a unsym. **initiator** RN:NLA, (R = a unit forming a **free radical** which does not **initiate polymn.**; A = a unit reacting with a polymer core functional group; L (a unit forming a **free radical** moiety) = (un)substituted C1-C10 linear or branched alkylene, C3-20 arylene, C4-20 alkyl-substituted arylene, C4-C20 alkylarylene; e.g., 4-[(triphenylmethyl)azobenzoic acid]] with a polymer core having n functional groups (e.g., Starburst 1st Generation) reacting with the unsym. **initiator** to form a conjugate [RN:NLA']<sub>n</sub>[Core] (A' = linking unit to the polymer core); (b) adding to the conjugate .gtoreq.1 monomer (e.g., Bu **acrylate**) to form a reaction mixt.; and (c) **initiating polymn.** at 0-160.degree.. The **initiators** and processes are esp., useful for dendrimer or "star" polymers.

ST unsym **free radical initiator polymn**

IT Radical scavengers  
 (process for **polymn.** using unsym. **free-radical initiators** to control type and d.p.)

IT **Polymerization** catalysts  
 (radical, unsym.; process for **polymn.** using unsym. **free-radical initiators** to control type and d.p.)

IT **Polymerization**  
 (radical; process for **polymn.** using unsym. **free-radical initiators** to control type and d.p.)

IT 76-83-5, Triphenylmethylchloride 619-67-0, 4-Hydrazinobenzoic acid  
 RL: RCT (Reactant); RACT (Reactant or reagent)  
 (prepn. of unsym. **free-radical initiators**)

IT 142986-44-5DP, Starburst 1st Generation, reaction products with (triphenylmethyl)azobenzoic acid 158465-66-8DP, 3-Aminopropylmethylsilanediol-dimethylsilanediol copolymer, reaction products with (triphenylmethyl)azobenzoic acid 305802-34-0DP, reaction products with polymer core 305809-43-2P  
 RL: CAT (Catalyst use); IMF (Industrial manufacture); PREP (Preparation); USES (Uses)

(process for **polymn.** using unsym. **free-radical initiators** to control type and d.p.)

IT 9003-49-0P, Butyl **acrylate** polymer 9003-53-6P, Polystyrene 9011-14-7P, Poly(methyl **methacrylate**)  
 RL: IMF (Industrial manufacture); POF (Polymer in formulation); PREP (Preparation); USES (Uses)

(process for **polymn.** using unsym. **free-radical initiators** to control type and d.p.)

IT 5873-93-8, Di(thiobenzoyl) disulfide 188526-94-5, N-tert-Butyl N-(1-diethylphosphono-2,2-dimethylpropyl) nitroxyl radical  
 RL: MOA (Modifier or additive use); USES (Uses)  
 (radical scavenger; process for **polymn.** using unsym. **free-radical initiators** to control type and d.p.)

RE.CNT 4 THERE ARE 4 CITED REFERENCES AVAILABLE FOR THIS RECORD

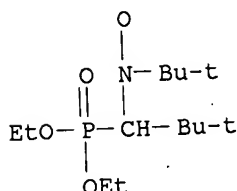


RE

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IT 188526-94-5, N-tert-Butyl N-(1-diethylphosphono-2,2-dimethylpropyl) nitroxyl radical  
 RL: MOA (Modifier or additive use); USES (Uses)  
 (radical scavenger; process for **polymn.** using unsym.  
**free-radical initiators** to control type and  
 d.p.)

RN 188526-94-5 HCAPLUS  
 CN Nitroxide, 1-(diethoxyphosphinyl)-2,2-dimethylpropyl 1,1-dimethylethyl  
 (9CI) (CA INDEX NAME)



L32 ANSWER 37 OF 59 HCAPLUS COPYRIGHT 2003 ACS

AN 2000:758837 HCAPLUS

DN 134:42480

TI Mechanistic aspects of nitroxide-mediated controlled radical polymerization of styrene in miniemulsion, using a water-soluble radical initiator

AU Farcet, C.; Lansalot, M.; Charleux, B.; Pirri, R.; Vairon, J. P.

CS Laboratoire de Chimie Macromoléculaire UMR 7610, Université Pierre et Marie Curie, Paris, 75252, Fr.

SO Macromolecules (2000), 33(23), 8559-8570  
 CODEN: MAMOBX; ISSN: 0024-9297

PB American Chemical Society

DT Journal

LA English

CC 35-3 (Chemistry of Synthetic High **Polymers**)

AB Nitroxide-mediated controlled **free-radical polymn.** of styrene was studied in a miniemulsion system. The use of an acyclic .beta.-phosphonylated nitroxide enabled **polymn.** to be performed at a temp. below 100 .degree.C, typically 90 .degree.C. A bicomponent initiating system was chosen, i.e., a radical initiator in conjunction with added free nitroxide. This work focused on the mechanistic understanding of the **polymn.** The parameters that affect both the kinetics of **polymn.** and the control of the mol. wt. and mol. wt. distribution have been examd. and discussed, such as the nature and concn. of the pH buffer, the initiator concn., the monomer/water ratio, and the process for chain extension.

ST nitroxide mediated miniemulsion radical **polymn** styrene

IT Buffers

(effect on nitroxide-mediated controlled radical **polymn.** of styrene in miniemulsion)

IT Polymerization

- (microemulsion, mechanism; nitroxide-mediated controlled miniemulsion radical polymn. of styrene)
- IT Molecular weight  
Molecular weight distribution  
(of polystyrene; from nitroxide-mediated controlled radical polymn. in miniemulsion)
- IT Polymerization catalysts  
(radical; in nitroxide-mediated controlled miniemulsion radical polymn. of styrene)
- IT Polymerization kinetics  
(radical; of nitroxide-mediated controlled miniemulsion radical polymn. of styrene)
- IT 144-55-8, Sodium bicarbonate, uses 584-08-7, Potassium carbonate  
RL: NUU (Other use, unclassified); USES (Uses)  
(buffer; in nitroxide-mediated controlled radical polymn. of styrene in miniemulsion)
- IT 7647-14-5, Sodium chloride, uses  
RL: NUU (Other use, unclassified); USES (Uses)  
(effect on nitroxide-mediated controlled radical polymn. of styrene in miniemulsion)
- IT 9003-53-6P, Polystyrene  
RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)  
(from nitroxide-mediated controlled radical polymn. of styrene in miniemulsion)
- IT 188526-94-5  
RL: CAT (Catalyst use); USES (Uses)  
(in nitroxide-mediated controlled radical polymn. of styrene in miniemulsion)
- IT 7681-57-4, Sodium metabisulfite 7727-21-1, Potassium persulfate  
RL: CAT (Catalyst use); USES (Uses)  
(initiator; in nitroxide-mediated controlled radical polymn. of styrene in miniemulsion)
- IT 100-42-5, Styrene, reactions.  
RL: PEP (Physical, engineering or chemical process); PRP (Properties); RCT (Reactant); PROC (Process); RACT (Reactant or reagent)  
(nitroxide-mediated controlled radical polymn. in miniemulsion)
- RE.CNT 58 THERE ARE 58 CITED REFERENCES AVAILABLE FOR THIS RECORD
- RE

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- (57) Wang, J; J Am Chem Soc 1995, V117, P5614 HCAPLUS
- (58) Yutani, Y; US 5439980 1995 HCAPLUS

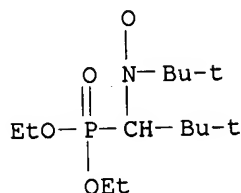
IT 188526-94-5

RL: CAT (Catalyst use); USES (Uses)

(in nitroxide-mediated controlled radical polymn. of styrene in miniemulsion)

RN 188526-94-5 HCAPLUS

CN Nitroxide, 1-(diethoxyphosphinyl)-2,2-dimethylpropyl 1,1-dimethylethyl (9CI) (CA INDEX NAME)



L32 ANSWER 38 OF 59 HCAPLUS COPYRIGHT 2003 ACS

AN 2000:756754 HCAPLUS

DN 133:322570

TI Method for the production of a controlled rheological propylene resin

IN Bertin, Denis; Robert, Patrice

PA Atofina, Fr.

SO PCT Int. Appl., 48 pp.

CODEN: PIXXD2

DT Patent

LA French

IC ICM C08F008-50

CC 37-3 (Plastics Manufacture and Processing)

FAN.CNT 1

|      | PATENT NO.  | KIND | DATE     | APPLICATION NO. | DATE     |
|------|---|------|----------|-----------------|----------|
| PI   | WO 2000063260   | A1   | 20001026 | WO 2000-FR1026  | 20000419 |
|      | W:  |      |          |                 |          |
|      | AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR,     |      |          |                 |          |
|      | CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU,     |      |          |                 |          |
|      | ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU,     |      |          |                 |          |
|      | LV, MA, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE,     |      |          |                 |          |
|      | SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA,     |      |          |                 |          |
|      | ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM                              |      |          |                 |          |
|      | RW: GH, GM, KE, LS, MW, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY, DE, |      |          |                 |          |
|      | DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF,     |      |          |                 |          |
|      | CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG                      |      |          |                 |          |
|      | FR 2792321  | A1   | 20001020 | FR 1999-4888    | 19990419 |
|      | EP 1192192  | A1   | 20020403 | EP 2000-920844  | 20000419 |
|      | EP 1192192  | B1   | 20030326 |                 |          |
|      | R:  |      |          |                 |          |
|      | AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT,     |      |          |                 |          |
|      | IE, SI, LT, LV, FI, RO  |      |          |                 |          |
|      | JP 2002542346   | T2   | 20021210 | JP 2000-612345  | 20000419 |
|      | AT 235521   | E    | 20030415 | AT 2000-920844  | 20000419 |
| PRAI | FR 1999-4888  | A    | 19990419 |                 |          |
|      | WO 2000-FR1026  | W    | 20000419 |                 |          |

AB The invention relates to a method for the prodn. of a controlled rheol. homopolymer or copolymer of propylene or a compn. comprising a homopolymer or copolymer of propylene in the absence of a functional monomer. The inventive method increases the melt flow index of the resin by cutting the chains using a **polymn.** initiator and is characterized in that at least one stable **free radical** is incorporated into the resin in a viscous state, whereupon a solid product is formed having an increased melt flow index. The stable **free radical** or **radicals** are more particularly chosen from nitroxyl radicals, contg. at least one group :NO.bul..

ST melt flow enhancement propylene polymer; polymn initiator degrdn propylene polymer; nitroxyl incorporation propylene polymer

IT Polymer degradation

## Polymerization catalysts

(manuf. of propylene polymers with increased melt flow by degrdn. with polymn. catalysts and incorporation of nitroxyl radicals)

## IT Nitroxides

RL: MOA (Modifier or additive use); USES (Uses)

(manuf. of propylene polymers with increased melt flow by degrdn. with polymn. catalysts and incorporation of nitroxyl radicals)

- IT 2154-68-9, 3-Carboxy-2,2,5,5-tetramethylpyrrolidinyloxy 2226-96-2, TEMPOL 2516-92-9, Bis(1-oxyl-2,2,6,6-tetramethylpiperidin-4-yl) sebacate 2525-39-5, 2,4,6-Tri-tert-butylphenoxy 2564-83-2, TEMPO 2896-70-0, 4-Oxo-2,2,6,6-tetramethyl-1-piperidinyloxy 3229-53-6, 2,2,5,5-Tetramethyl-1-pyrrolidinyloxy 61015-94-9, N-tert-Butyl-1-phenyl-2-methyl propyl nitroxide 95407-69-5, 4-Methoxy-2,2,6,6-tetramethyl-1-piperidinyloxy 188526-94-5, N-tert-Butyl-1-diethylphosphono-2,2-dimethylpropyl nitroxide 188707-72-4, N-tert-Butyl-1-dibenzylphosphono-2,2-dimethyl propyl nitroxide 200345-02-4, N-tert-Butyl-1-(2-naphthyl)-2-methyl propyl nitroxide 200345-03-5, N-Phenyl-1-diethylphosphono-2,2-dimethyl propyl nitroxide 200345-04-6, N-Phenyl-1-diethylphosphono-1-methyl ethyl nitroxide 200345-05-7, N-(1-Phenyl 2-methyl propyl)-1-diethylphosphono-1-methyl ethyl nitroxide 258354-63-1, N-tert-Butyl-[(1-diethylphosphono)-2-methylpropyl] nitroxide 261527-17-7, N-tert-Butyl-1-di(2,2,2-trifluoroethyl)phosphono-2,2-dimethyl propyl nitroxide 263355-91-5 302906-69-0, N-(1-Phenylbenzyl)-[(1-diethylphosphono)-1-methyl ethyl] nitroxide

RL: MOA (Modifier or additive use); USES (Uses)

(manuf. of propylene polymers with increased melt flow by degrdn. with polymn. catalysts and incorporation of nitroxyl radicals)

- IT 9003-07-0, Polypropylene 106565-43-9, Ethylene-propylene block copolymer  
RL: PEP (Physical, engineering or chemical process); POF (Polymer in formulation); PRP (Properties); PROC (Process); USES (Uses)

(manuf. of propylene polymers with increased melt flow by degrdn. with polymn. catalysts and incorporation of nitroxyl radicals)

- IT 75-91-2, tert-Butyl hydroperoxide 78-63-7, 2,5-Bis(tert-butylperoxy)-2,5-dimethylhexane 78-67-1, 2,2'-Azobis(isobutyronitrile) 80-15-9, Cumyl hydroperoxide 80-47-7, p-Menthane hydroperoxide 94-36-0, Benzoyl peroxide, reactions 105-74-8, Lauroyl peroxide 107-71-1, tert-Butyl peroxyacetate 109-13-7, tert-Butyl peroxyisobutyrate 110-05-4, Di-tert-butyl peroxide 614-45-9, tert-Butyl peroxybenzoate 686-31-7, tert-Amyl peroxy-2-ethylhexanoate 762-12-9, Decanoyl peroxide 927-07-1, tert-Butyl peroxy-pivalate 995-33-5, Butyl 4,4-di(tert-butylperoxy)valerate 1068-27-5, 2,5-Dimethyl-2,5-di(tert-butylperoxy)-3-hexyne 1561-49-5, Dicyclohexyl peroxydicarbonate 1931-62-0, tert-Butyl peroxy-maleate 2167-23-9, 2,2-Di(tert-butylperoxy)butane 2212-81-9, 2,3,7,8-Tetra-tert-butyl-2,3,7,8-tetramethyl-1,2,3,4-tetrahydrophthalene 2372-21-6, OO-tert-butyl-O-isopropylmonoperoxy carbonate 2618-77-1, 2,5-Dimethyl-2,5-di(benzoylperoxy)hexane 3006-82-4, tert-Butyl peroxy-2-ethylhexanoate 3006-86-8, 1,1-Di(tert-butylperoxy)cyclohexane 3025-88-5, 2,5-Dimethyl-2,5-di(hydroperoxy)hexane 3088-74-2, 2,2-Bis(4,4-di-tert-butylperoxycyclohexyl)propane 3179-56-4, Acetyl cyclohexylsulfonyle peroxide 3425-61-4, tert-Amyl hydroperoxide 3457-61-2, tert-Butyl cumyl peroxide 3851-87-4, 3,5,5-Trimethylhexanoyl peroxide 4419-11-8, 2,2'-Azobis(2,4-dimethylvaleronitrile) 6731-36-8, 1,1-Di(tert-butylperoxy)-3,3,5-trimethylcyclohexane 10508-09-5, Di-tert-amyl peroxide 13052-09-0 13122-18-4, tert-Butyl peroxy-3,5,5-trimethylhexanoate 13472-08-7, 2,2'-Azobis(2-methylbutyronitrile) 15545-97-8, 2,2'-Azobis(2,4-dimethyl-4-methoxyvaleronitrile) 15667-10-4, 1,1-Di(tert-amylperoxy)cyclohexane 16111-62-9, Di(2-ethylhexyl) peroxydicarbonate 22397-33-7,

3,3,6,6,9,9-Hexamethyl-1,2,4,5-tetraoxacyclononane 25251-51-8,  
 3-Phenyl-3-tert-butylperoxyphthalide 26637-80-9, Diisopropylbenzene  
 monohydroperoxide 26748-41-4, tert-Butyl peroxyneodecanoate  
 26748-47-0, .alpha.-Cumyl peroxyneodecanoate 27836-52-8, tert-Butyl  
 peroxyisononanoate 29240-17-3, tert-Amyl peroxy-pivalate 34443-12-4,  
 OO-tert-butyl-O-(2-ethylhexyl)monoperoxy carbonate 40888-97-9,  
 2,2'-Azobis(2-acetoxyp propane) 51241-23-7, 2,2'-  
 Azobis(cyclohexanenitrile) 55794-20-2, Ethyl 3,3-di(tert-  
 butylperoxy)butyrate 67567-23-1, Ethyl 3,3-di(tert-amylperoxy)butyrate  
 68299-16-1, tert-Amyl peroxyneodecanoate 68860-54-8, tert-Amyl  
 peroxy-3,5,5-trimethylhexanoate 70833-40-8, OO-tert-amyl-O-(2-  
 ethylhexyl)monoperoxy carbonate 95718-78-8, 3-Hydroxy-1,1-dimethylbutyl  
 peroxyneodecanoate

RL: RCT (Reactant); RACT (Reactant or reagent)

(manuf. of propylene polymers with increased melt flow by degrdn. with  
 polymn. catalysts and incorporation of nitroxyl radicals)

RE.CNT 8 THERE ARE 8 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE

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- (2) Elf Atochem S A; EP 0837080 A 1998 HCAPLUS
- (3) Esso Research And Engineering Company; FR 2132780 A 1972 HCAPLUS
- (4) Kayaku Noury Corporation; EP 0264156 A 1988 HCAPLUS
- (5) Lentia Gmbh Chem Und Pharm Erzeugnisse; DE 1694563 A 1970 HCAPLUS
- (6) Pcd-Polymere Gmbh; EP 0632062 A 1995 HCAPLUS
- (7) Scott, G; WO 8501508 A 1985 HCAPLUS
- (8) Witco Corporation; EP 0853090 A 1998 HCAPLUS

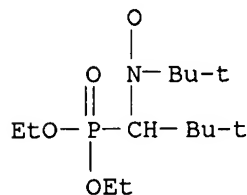
IT 188526-94-5, N-tert-Butyl-1-diethylphosphono-2,2-dimethylpropyl  
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 dimethyl propyl nitroxide 200345-03-5, N-Phenyl-1-  
 diethylphosphono-2,2-dimethyl propyl nitroxide 200345-05-7,  
 N-(1-Phenyl 2-methyl propyl)-1-diethylphosphono-1-methyl ethyl nitroxide  
 258354-63-1, N-tert-Butyl-[(1-diethylphosphono)-2-methylpropyl]  
 nitroxide 261527-17-7, N-tert-Butyl-1-di(2,2,2-  
 trifluoroethyl)phosphono-2,2-dimethyl propyl nitroxide 263355-91-5  
 302906-69-0, N-(1-Phenylbenzyl)-[(1-diethylphosphono)-1-methyl  
 ethyl] nitroxide

RL: MOA (Modifier or additive use); USES (Uses)

(manuf. of propylene polymers with increased melt flow by degrdn. with  
 polymn. catalysts and incorporation of nitroxyl radicals)

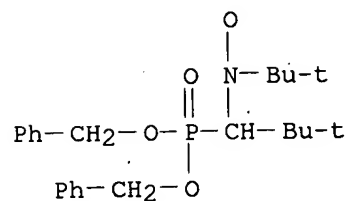
RN 188526-94-5 HCAPLUS

CN Nitroxide, 1-(diethoxyphosphinyl)-2,2-dimethylpropyl 1,1-dimethylethyl  
 (9CI) (CA INDEX NAME)



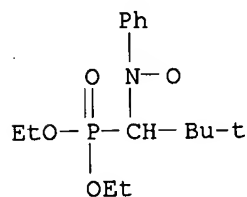
RN 188707-72-4 HCAPLUS

CN Nitroxide, 1-[bis(phenylmethoxy)phosphinyl]-2,2-dimethylpropyl  
 1,1-dimethylethyl (9CI) (CA INDEX NAME)



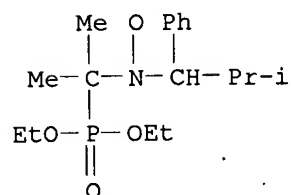
RN 200345-03-5 HCAPLUS

CN Nitroxide, 1-(diethoxyphosphinyl)-2,2-dimethylpropyl phenyl (9CI) (CA INDEX NAME)



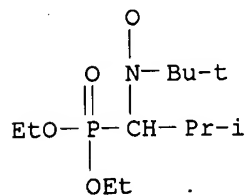
RN 200345-05-7 HCAPLUS

CN Nitroxide, 1-(diethoxyphosphinyl)-1-methylethyl 2-methyl-1-phenylpropyl (9CI) (CA INDEX NAME)



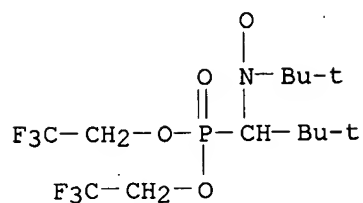
RN 258354-63-1 HCAPLUS

CN Nitroxide, 1-(diethoxyphosphinyl)-2-methylpropyl 1,1-dimethylethyl (9CI) (CA INDEX NAME)



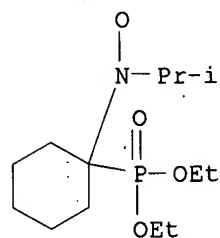
RN 261527-17-7 HCAPLUS

CN Nitroxide, 1-[bis(2,2,2-trifluoroethoxy)phosphinyl]-2,2-dimethylpropyl 1,1-dimethylethyl (9CI) (CA INDEX NAME)



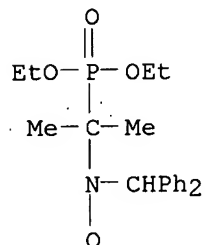
RN 263355-91-5 HCAPLUS

CN Nitroxide, 1-(diethoxyphosphinyl)cyclohexyl 1-methylethyl (9CI) (CA INDEX NAME)



RN 302906-69-0 HCAPLUS

CN Nitroxide, 1-(diethoxyphosphinyl)-1-methylethyl diphenylmethyl (9CI) (CA INDEX NAME)



L32 ANSWER 39 OF 59 HCAPLUS COPYRIGHT 2003 ACS

AN 2000:646046 HCAPLUS

DN 133:238503

TI Controlled **free radical** emulsion and water-based **polymerizations** and seeded methodologies

IN Klaerner, Gerrit; Safir, Adam; Nielsen, Ralph B.; Jandeleit, Bernd; Huefner, Peter; Li, Yunxiao

PA Symyx Technologies, Inc., USA

SO PCT Int. Appl., 139 pp.

CODEN: PIXXD2

DT Patent

LA English

IC ICM C08F002-22

ICS C08F002-38

CC 35-4 (Chemistry of Synthetic High **Polymers**)

FAN.CNT 4



|      | PATENT NO.   | KIND | DATE     | APPLICATION NO. | DATE     |
|------|--|------|----------|-----------------|----------|
| PI   | WO 2000053640  | A1   | 20000914 | WO 2000-US6176  | 20000308 |
|      | W: AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK, DM, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, UZ, VN, YU, ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM  |      |          |                 |          |
|      | RW: GH, GM, KE, LS, MW, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG   |      |          |                 |          |
|      | US 2002010267  | A1   | 20020124 | US 1999-347607  | 19990702 |
|      | US 2002061988  | A1   | 20020523 | US 1999-347609  | 19990702 |
|      | US 6472486   | B2   | 20021029 |                 |          |
|      | AU 2000037338  | A5   | 20000928 | AU 2000-37338   | 20000308 |
|      | EP 1165625   | A1   | 20020102 | EP 2000-916194  | 20000308 |
|      | R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO  |      |          |                 |          |
|      | US 2002001845  | A1   | 20020103 | US 2001-911683  | 20010724 |
| PRAI | US 1999-123498P  | P    | 19990309 |                 |          |
|      | US 1999-347606   | A    | 19990702 |                 |          |
|      | US 1999-347607   | A    | 19990702 |                 |          |
|      | US 1999-347608   | A    | 19990702 |                 |          |
|      | US 1999-347609   | A    | 19990702 |                 |          |
|      | US 1999-146936P  | P    | 19990731 |                 |          |
|      | US 2000-177879P  | P    | 20000124 |                 |          |
|      | WO 2000-US6176   | W    | 20000308 |                 |          |
|      | US 2000-609461   | A3   | 20000703 |                 |          |
| AB   | Nitroxides having an alpha-carbon atom with a destabilizing moiety are effective control agents for emulsion and water-based polymns., including the formation of block copolymers from a wide range of monomers. The nitroxide radicals may be used as a free radical or as an adduct with a residue from the initiator. The emulsions have living characteristics, including the re-initiation of polymer chains. Also, a seeded process for emulsions, which includes the step-wise addn. of monomer is disclosed, providing access to a wide range of initiator types. |      |          |                 |          |
| ST   | radical emulsion polymn nitroxide control agent  |      |          |                 |          |
| IT   | Nitroxides   |      |          |                 |          |
|      | RL: CAT (Catalyst use); IMF (Industrial manufacture); PREP (Preparation); USES (Uses)  |      |          |                 |          |
|      | (controlled free radical emulsion and water-based polymns. and seeded methodologies)   |      |          |                 |          |
| IT   | Thermoplastic rubber   |      |          |                 |          |
|      | RL: IMF (Industrial manufacture); PREP (Preparation)   |      |          |                 |          |
|      | (controlled free radical emulsion and water-based polymns. and seeded methodologies)   |      |          |                 |          |
| IT   | <b>Polymerization</b>  |      |          |                 |          |
|      | (emulsion, <b>radical</b> ; controlled <b>free radical</b> emulsion and water-based polymns. and seeded methodologies)   |      |          |                 |          |
| IT   | Emulsions  |      |          |                 |          |
|      | (polymer; controlled free radical emulsion and water-based polymns. and seeded methodologies)  |      |          |                 |          |
| IT   | 9003-53-6P, Styrene homopolymer 25085-34-1P, Acrylic acid styrene copolymer 28445-37-6P 31619-79-1P, Styrene 4-styrenesulfonic acid sodium salt copolymer 61015-94-9P 76790-28-8P 89933-24-4P 107391-68-4P, Butylmethacrylate Styrene block copolymer 110772-34-4P, Butyl acrylate Styrene block copolymer 131830-42-7P, Acrylic acid  |      |          |                 |          |

butylacrylate styrene block copolymer 293328-07-1P 293328-08-2P  
 293328-10-6P 293328-18-4P **293328-19-5P** 293328-20-8P  
**293328-21-9P** 293328-22-0P 293328-23-1P 293328-27-5P  
 293328-28-6P, 2-Acrylamido-2-methylpropanesulfonic acid-tert-  
 butylacrylamide-styrene copolymer 293328-29-7P, 2-Acrylamido-2-  
 methylpropanesulfonic acid-butyl acrylate-tert-butylacrylamide copolymer  
 293328-31-1P 293328-32-2P

RL: IMF (Industrial manufacture); PREP (Preparation)

(controlled free radical emulsion and water-based polymns. and seeded methodologies)

IT 72877-60-2P

RL: IMF (Industrial manufacture); NUU (Other use, unclassified); PREP (Preparation); USES (Uses)

(controlled free radical emulsion and water-based polymns. and seeded methodologies)

IT 10250-27-8P 179419-05-7P 227000-85-3P 270901-81-0P 293328-09-3P  
 293328-11-7P **293328-12-8P** 293328-13-9P 293328-14-0P  
 293328-15-1P 293328-16-2P 293328-17-3P 293328-26-4P

RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)

(controlled free radical emulsion and water-based polymns. and seeded methodologies)

IT 78-67-1 98-88-4, Benzoylchloride 100-42-5, reactions 100-43-6,  
 4-Vinylpyridine 124-68-5 500-22-1, Pyridine-3-carboxaldehyde  
 1068-55-9, Isopropylmagnesium chloride 1112-56-7, Tetravinyltin  
 1122-91-4, 4-Bromobenzaldehyde 2039-82-9 2633-67-2 3317-61-1,  
 5,5-Dimethyl-.DELTA.1-pyrroline N-oxide 3376-24-7, N-tert-Butyl-.alpha.-  
 phenylnitrone 6921-35-3, 3,3-Dimethyloxetane 7677-24-9,  
 Trimethylsilylcyanide 30030-25-2 51760-21-5, Dimethyl  
 5-bromoisophthalate 57497-39-9, N-tert-Butylhydroxylamine hydrochloride  
 RL: RCT (Reactant); RACT (Reactant or reagent)

(controlled free radical emulsion and water-based polymns. and seeded methodologies)

RE.CNT 7 THERE ARE 7 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE

- (1) Finet, J; WO 9624620 A 1996 HCAPLUS
- (2) Lansalot, M; DATABASE COMPENDEX
- (3) Lansalot, M; PROCEEDINGS OF THE AMERICAN CHEMICAL SOCIETY 'POLYMER PREPRINTS' 1999, V40(2), P317 HCAPLUS
- (4) Marestin, C; DATABASE COMPENDEX
- (5) Marestin, C; MACROMOLECULES 1998, V31(12), P4041 HCAPLUS
- (6) Moad, G; WO 9830601 A 1998 HCAPLUS
- (7) Morrison, B; WO 9900426 A 1999 HCAPLUS

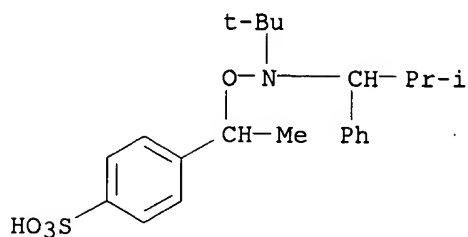
IT **293328-19-5P 293328-21-9P**

RL: IMF (Industrial manufacture); PREP (Preparation)

(controlled free radical emulsion and water-based polymns. and seeded methodologies)

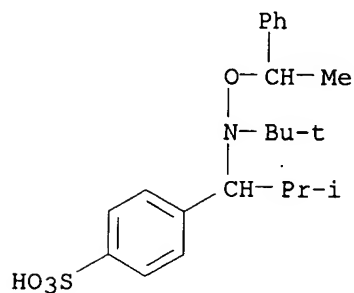
RN 293328-19-5 HCAPLUS

CN Benzenesulfonic acid, 4-[1-[[[(1,1-dimethylethyl)(2-methyl-1-phenylpropyl)amino]oxy]ethyl]-, sodium salt (9CI) (CA INDEX NAME)



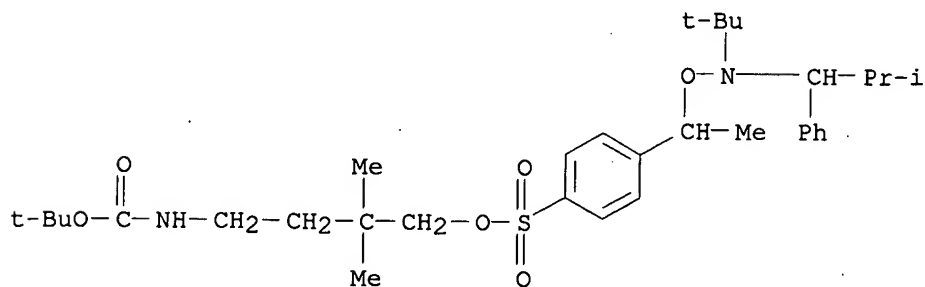
● Na

RN 293328-21-9 HCAPLUS  
 CN Benzenesulfonic acid, 4-[1-[(1,1-dimethylethyl)(1-phenylethoxy)amino]-2-methylpropyl]-, lithium salt (9CI) (CA INDEX NAME)



● Li

IT **293328-12-8P**  
 RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)  
 (controlled free radical emulsion and water-based polymns. and seeded methodologies)  
 RN 293328-12-8 HCAPLUS  
 CN Benzenesulfonic acid, 4-[1-[[[(1,1-dimethylethyl)(2-methyl-1-phenylpropyl)amino]oxy]ethyl]-, 4-[[[(1,1-dimethylethoxy)carbonyl]amino]-2,2-dimethylbutyl ester (9CI) (CA INDEX NAME)



- L32 ANSWER 40 OF 59 HCAPLUS COPYRIGHT 2003 ACS  
 AN 2000:610046 HCAPLUS  
 DN 133:322182  
 TI Synthesis of polystyrene-**polyacrylate** block copolymers by  
 nitroxide-mediated radical **polymerization**  
 AU Robin, Sophie; Gnanou, Yves  
 CS Laboratoire de Chimie des Polymeres Organiques, ENSCPB-CNRS-Universite  
 Bourdeaux 1, Talence, 33402, Fr.  
 SO ACS Symposium Series (2000), 768(Controlled/Living Radical  
 Polymerization), 334-346  
 CODEN: ACSMC8; ISSN: 0097-6156  
 PB American Chemical Society  
 DT Journal  
 LA English  
 CC 35-3 (Chemistry of Synthetic High **Polymers**)  
 AB This paper discusses the conditions the best suited to the prepn. of well  
 defined polystyrene (PS)/poly(Bu **acrylate**) (PBuA), using the  
 .beta.-hydrogen-contg. phosphonylated nitroxide N-tert-butyl-N-[1-(di-Et  
 phosphono)-2,2-dimethylpropyl]nitroxyl. Using kinetic data to compute the  
 rates of cross-addn. and propagation of the second monomer, it is  
 demonstrated that **polymg.** Bu **acrylate** (BuA) before  
 styrene should give rise to well defined PBuA-b-PS copolymer samples.  
 This prediction was exptl. confirmed subsequently. When styrene was  
**polymd.** first, the copolymer formed was contaminated with a  
 substantial amt. of residual PS macroinitiator: the difference between the  
 rates of cross-addn. and propagation of BuA resulted in a fast growth of  
 those of the PBuA blocks that were **initiated**, causing the medium  
 to partition in mesophases with the residual PS precursor entrapped in the  
 monomer-poor phase.  
 ST styrene butyl **acrylate** block **polymn** kinetics;  
 nitroxide mediated radical block **polymn**  
 IT **Polymerization**  
 (block, radical, mechanism; styrene-Bu **acrylate** block  
 copolymn. by nitroxide-mediated radical **polymn.**)  
 IT **Polymerization** catalysts  
 (block, radical; styrene-Bu **acrylate** block copolymn. by  
 nitroxide-mediated radical **polymn.**)  
 IT **Polymerization** kinetics  
 (block; of styrene-Bu **acrylate** block copolymn. by  
 nitroxide-mediated radical **polymn.**)  
 IT **Polymerization** kinetics  
 (radical; of styrene-Bu **acrylate** block copolymn. by  
 nitroxide-mediated radical **polymn.**)  
 IT 78-67-1, AIBN  
 RL: CAT (Catalyst use); USES (Uses)  
 (cocatalyst; in prepn. of styrene-Bu **acrylate** block  
 copolymers by nitroxide-mediated radical **polymn.**)  
 IT 110772-34-4P, Butyl **acrylate**-styrene block copolymer  
 RL: SPN (Synthetic preparation); PREP (Preparation)  
 (diblock; prepn. of styrene-Bu **acrylate** block copolymers by  
 nitroxide-mediated radical **polymn.**)  
 IT 188526-94-5  
 RL: CAT (Catalyst use); USES (Uses)  
 (in prepn. of styrene-Bu **acrylate** block copolymers by  
 nitroxide-mediated radical **polymn.**)  
 IT 100-42-5, Styrene, reactions 141-32-2, Butyl **acrylate**

RL: PRP (Properties); RCT (Reactant); RACT (Reactant or reagent)  
(kinetics of styrene-Bu **acrylate** block copolymn. by  
nitroxide-mediated radical **polymn.**)

RE.CNT 17 THERE ARE 17 CITED REFERENCES AVAILABLE FOR THIS RECORD  
RE

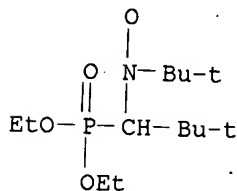
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- (3) Benoit, D; J Am Chem Soc 1999, V16(121), P3904
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HCAPLUS
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- (15) Robin, S; Polym Prepr 1999, V40(2), P387 HCAPLUS
- (16) Shipp, D; Macromolecules 1999, V32, P2948 HCAPLUS
- (17) Veregin, R; Macromolecules 1996, V29, P4161 HCAPLUS

IT 188526-94-5

RL: CAT (Catalyst use); USES (Uses)  
(in prepn. of styrene-Bu **acrylate** block copolymers by  
nitroxide-mediated radical **polymn.**)

RN 188526-94-5 HCAPLUS

CN Nitroxide, 1-(diethoxyphosphinyl)-2,2-dimethylpropyl 1,1-dimethylethyl  
(9CI) (CA INDEX NAME)



- L32 ANSWER 41 OF 59 HCAPLUS COPYRIGHT 2003 ACS
- AN 2000:593981 HCAPLUS
- DN 133:297016
- TI Macromolecular engineering using novel alkoxyamines
- AU Granou, Yves; Robin, Sophie; Guerrer, O.; Couturier, J. L.
- CS Laboratoire de Chimie des Polymeres Organiques, ENSCPB-CNRS-Universite  
Bordeaux 1 (UMR 5629), Talence, 33402, Fr.
- SO Polymer Preprints (American Chemical Society, Division of Polymer  
Chemistry) (2000), 41(2), 1352-1353  
CODEN: ACPPAY; ISSN: 0032-3934
- PB American Chemical Society, Division of Polymer Chemistry
- DT Journal
- LA English
- CC 37-3 (Plastics Manufacture and Processing)
- AB Mono, di, and trifunctional alkoxyamines based on N-tert-butyl-N-(1-

diethylphosphono-2,2-dimethyl)propyl nitroxide were used to polymerize styrene and Bu acrylate, affording well-defined of linear and star structures. Triblock as well as star block copolymers constituted of poly(Bu acrylate) inner part and polystyrene outer shell were subsequently synthesized by sequentially polymn. of these two monomers, using dialkoxyamine and trialkoxyamine as initiators.

- ST alkoxyamine polymn catalyst styrene butyl acrylate; triblock copolymer styrene butyl acrylate prepn; starblock copolymer styrene butyl acrylate prepn; polystyrene prepn catalyst alkoxyamine; polyacrylate prepn catalyst alkoxyamine
- IT Polymerization catalysts  
(polymn. of styrene and Bu acrylate in presence of alkoxyamine catalysts)
- IT 300811-93-2 300811-94-3 300811-95-4  
RL: CAT (Catalyst use); USES (Uses)  
(catalysts; polymn. of styrene and Bu acrylate in presence of alkoxyamine catalysts)
- IT 9003-49-0P, Poly(butyl acrylate)  
RL: SPN (Synthetic preparation); PREP (Preparation)  
(prepn. of linear and star-shaped poly(Bu acrylate) in presence of alkoxyamine catalysts)
- IT 9003-53-6P, Polystyrene  
RL: SPN (Synthetic preparation); PREP (Preparation)  
(prepn. of linear and star-shaped polystyrene in presence of alkoxyamine catalysts)
- IT 110772-34-4P, Butyl acrylate-styrene block copolymer  
RL: SPN (Synthetic preparation); PREP (Preparation)  
(starblock and triblock; prepn. in presence of alkoxyamine catalysts)
- RE.CNT 20 THERE ARE 20 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE

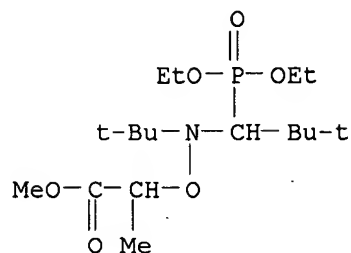
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IT 300811-93-2 300811-94-3

RL: CAT (Catalyst use); USES (Uses)  
(catalysts; polymn. of styrene and Bu acrylate in presence of alkoxyamine catalysts)

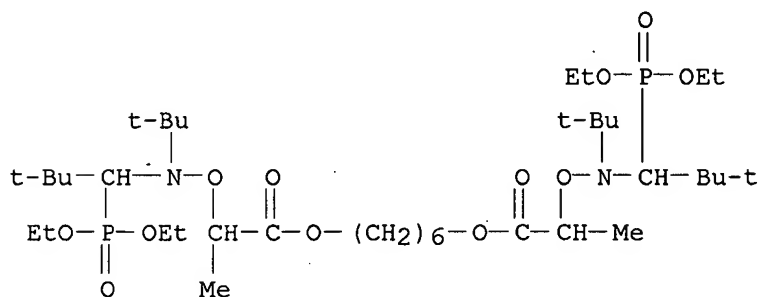
RN 300811-93-2 HCAPLUS

CN 3,7-Dioxa-4-aza-6-phosphanonanoic acid, 4,5-bis(1,1-dimethylethyl)-6-ethoxy-2-methyl-, methyl ester, 6-oxide (9CI) (CA INDEX NAME)



RN 300811-94-3 HCAPLUS

CN 3,7-Dioxa-4-aza-6-phosphanonanoic acid, 4,5-bis(1,1-dimethylethyl)-6-ethoxy-2-methyl-, 1,6-hexanediyl ester, 6,6'-dioxide (9CI) (CA INDEX NAME)



L32 ANSWER 42 OF 59 HCAPLUS COPYRIGHT 2003 ACS

AN 2000:592727 HCAPLUS

DN 133:177640

TI Alkoxyamines derived from phosphorus-containing nitroxides and their use  
 IN Couturier, Jean-Luc; Henriët-Bernard, Christiane; Le Mercier, Christophe;  
 Tordo, Paul; Lutz, Jean-Francois

PA Elf Atochem S.A., Fr.

SO PCT Int. Appl., 27 pp.

CODEN: PIXXD2

DT Patent

LA French

IC ICM C07F009-40

ICS C08F004-00

CC 35-3 (Chemistry of Synthetic High Polymers)

Section cross-reference(s): 29

FAN.CNT 1

| PATENT NO.  | KIND | DATE     | APPLICATION NO. | DATE     |
|---|------|----------|-----------------|----------|
| WO 2000049027   | A1   | 20000824 | WO 2000-FR335   | 20000210 |
| W: AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU,<br>CZ, DE, DK, DM, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL,<br>IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA,<br>MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI,<br>SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, VZ, VN, YU, ZA, ZW, AM,<br>AZ, BY, KG, KZ, MD, RU, TJ, TM<br>RW: GH, GM, KE, LS, MW, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY, DE, |      |          |                 |          |

DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG

|            |    |          |                |          |
|------------|----|----------|----------------|----------|
| FR 2789991 | A1 | 20000825 | FR 1999-1998   | 19990218 |
| FR 2789991 | B1 | 20020222 |                |          |
| EP 1153030 | A1 | 20011114 | EP 2000-903787 | 20000210 |
| EP 1153030 | B1 | 20020911 |                |          |

R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO

|               |    |          |                |          |
|---------------|----|----------|----------------|----------|
| AT 223922     | E  | 20020915 | AT 2000-903787 | 20000210 |
| JP 2002537304 | T2 | 20021105 | JP 2000-599765 | 20000210 |
| ES 2182777    | T3 | 20030316 | ES 2000-903787 | 20000210 |
| US 6569967    | B1 | 20030527 | US 2002-913940 | 20020319 |

PRAI FR 1999-1998 A 19990218  
WO 2000-FR335 W 20000210

OS MARPAT 133:177640

AB R4R5P(:O)CR1R2NR3OZ [R1, R2 = C1-10 alkyl, aryl, C.ltoreq.10 aralkyl; R1R2 = C2-7 hydrocarbylene; R3 = C1-30 hydrocarbyl; R4, R5 = C.ltoreq.20 cycloalkyl, C.ltoreq.20 aryl, C.ltoreq.20 alkoxy, C.ltoreq.20 aryloxy, C.ltoreq.20 aralkoxy, C.ltoreq.20 perfluoroalkyl, C.ltoreq.20 aralkyl, C.ltoreq.20 thioalkyl; R4R5 = C2-6 hydrocarbylene, optionally, contg. .gtoreq.1 of O or S; Z = CF3(CF2)5, Me2C(CN), or CR6R7R7; R6, R6, R7 = H, CN, C3-12 cycloalkyl, (CH2)nCO2R9; R9 = C1-6 alkyl; n = 0-6] are useful for initiators in radical polymn. A typical compd. was manufd. by reaction of 4 mmol PhCHMeBr 48 h with 2 mmol (EtO)2P(:O)CH(CMe3)N(CMe3)O.b ul. in PhMe in the presence of CuBr and 2,2'-bipyridine.

ST phosphorus contg nitroxide based alkoxyamine initiator radical polymn; tertiary butyldiethyl phosphonodimethylpropyl phenylethylhydroxyamine manuf initiator radical polymn

IT Amines, preparation  
RL: CAT (Catalyst use); IMF (Industrial manufacture); PREP (Preparation); USES (Uses)  
(alkoxy-; alkoxyamines derived from phosphorus-contg. nitroxides for initiators for radical polymn.)

IT Polymerization catalysts  
(radical; alkoxyamines derived from phosphorus-contg. nitroxides for initiators for radical polymn.)

IT 224575-61-5P 288583-05-1P 288583-07-3P  
288583-08-4P 288583-09-5P 288583-10-8P  
288583-75-5P 288583-76-6P 288583-77-7P  
288583-78-8P  
RL: CAT (Catalyst use); IMF (Industrial manufacture); PREP (Preparation); USES (Uses)  
(alkoxyamines derived from phosphorus-contg. nitroxides for initiators for radical polymn.)

IT 9003-53-6P, Polystyrene  
RL: IMF (Industrial manufacture); PREP (Preparation)  
(alkoxyamines derived from phosphorus-contg. nitroxides for initiators for radical polymn.)

IT 188526-94-5P  
RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)  
(precursor; alkoxyamines derived from phosphorus-contg. nitroxides for initiators for radical polymn.)

IT 100-39-0, Benzyl bromide 355-43-1, Perfluorohexyl iodide 585-71-7, (1-Bromoethyl)benzene 931-50-0, Cyclohexylmagnesium bromide 5445-17-0, Methyl 2-bromopropionate 21369-64-2, Hexyllithium 23426-63-3, Methyl 2-bromo-2-methylpropionate 41658-69-9, 2-Bromo-2-methylpropionitrile 227000-10-4, Diethyl 2,2-dimethyl-1-(1,1-dimethylethylamino)propanephospho



nate

RL: RCT (Reactant); RACT (Reactant or reagent)  
(precursor; alkoxyamines derived from phosphorus-contg. nitroxides for  
initiators for radical polymn.)

RE.CNT 14 THERE ARE 14 CITED REFERENCES AVAILABLE FOR THIS RECORD  
RE

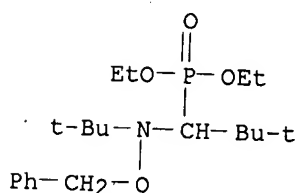
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  - (5) Le Mercier, C; POLYM PREPR (AM CHEM SOC, DIV POLYM CHEM) (ACPPAY, 00323934)  
1999, V40(2), P313 HCAPLUS
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1999, V40(2), P313 HCAPLUS
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  - (11) Shatzmiller, S; JUSTUS LIEBIGS ANNALEN DER CHEMIE 1991, 2, P161 HCAPLUS
  - (12) Shatzmiller, S; JUSTUS LIEBIGS ANNALEN DER CHEMIE 1993, 9, P955 HCAPLUS
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- IT 224575-61-5P 288583-05-1P 288583-07-3P  
288583-08-4P 288583-09-5P 288583-10-8P  
288583-75-5P 288583-76-6P 288583-77-7P  
288583-78-8P

RL: CAT (Catalyst use); IMF (Industrial manufacture); PREP (Preparation);  
USES (Uses)

(alkoxyamines derived from phosphorus-contg. nitroxides for  
initiators for radical polymn.)

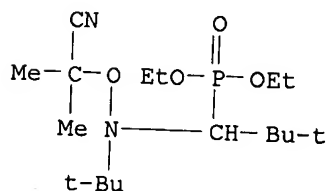
RN 224575-61-5 HCAPLUS

CN Phosphonic acid, [1-[(1,1-dimethylethyl)(phenylmethoxy)amino]-2,2-  
dimethylpropyl]-, diethyl ester (9CI) (CA INDEX NAME)

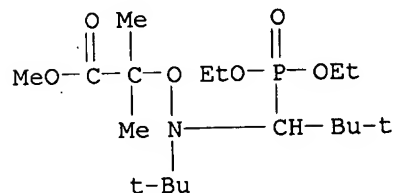


RN 288583-05-1 HCAPLUS

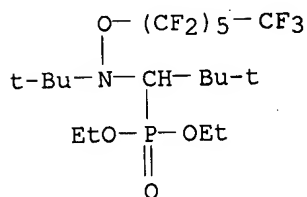
CN Phosphonic acid, [1-[(1-cyano-1-methylethoxy)(1,1-dimethylethyl)amino]-2,2-  
dimethylpropyl]-, diethyl ester (9CI) (CA INDEX NAME)



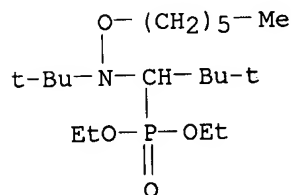
RN 288583-07-3 HCAPLUS  
 CN 3,7-Dioxa-4-aza-6-phosphanonanoic acid, 4,5-bis(1,1-dimethylethyl)-6-ethoxy-2,2-dimethyl-, methyl ester, 6-oxide (9CI) (CA INDEX NAME)



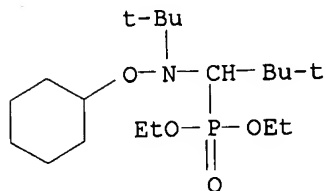
RN 288583-08-4 HCAPLUS  
 CN Phosphonic acid, [1-[(1,1-dimethylethyl)[(tridecafluorohexyl)oxy]amino]-2,2-dimethylpropyl]-, diethyl ester (9CI) (CA INDEX NAME)



RN 288583-09-5 HCAPLUS  
 CN Phosphonic acid, [1-[(1,1-dimethylethyl)(hexyloxy)amino]-2,2-dimethylpropyl]-, diethyl ester (9CI) (CA INDEX NAME)



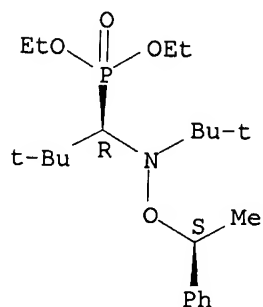
RN 288583-10-8 HCAPLUS  
 CN Phosphonic acid, [1-[(cyclohexyloxy)(1,1-dimethylethyl)amino]-2,2-dimethylpropyl]-, diethyl ester (9CI) (CA INDEX NAME)



RN 288583-75-5 HCAPLUS  
 CN Phosphonic acid, [(1R)-1-[(1,1-dimethylethyl)[(1S)-1-phenylethoxy]amino]-

2,2-dimethylpropyl]-, diethyl ester, rel- (9CI) (CA INDEX NAME)

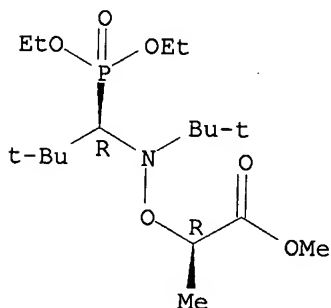
Relative stereochemistry.



RN 288583-76-6 HCAPLUS

CN 3,7-Dioxa-4-aza-6-phosphanonanoic acid, 4,5-bis(1,1-dimethylethyl)-6-ethoxy-2-methyl-, methyl ester, 6-oxide, (2R,5R)-rel- (9CI) (CA INDEX NAME)

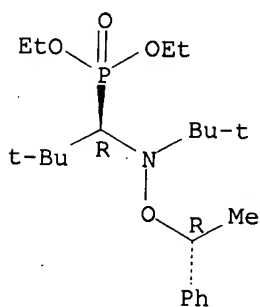
Relative stereochemistry.



RN 288583-77-7 HCAPLUS

CN Phosphonic acid, [(1R)-1-[(1,1-dimethylethyl)[(1R)-1-phenylethoxy]amino]-2,2-dimethylpropyl]-, diethyl ester, rel- (9CI) (CA INDEX NAME)

Relative stereochemistry.

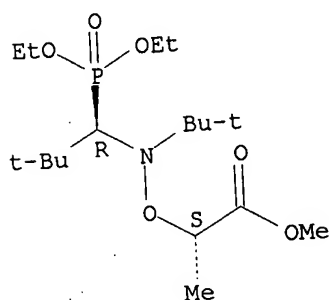


RN 288583-78-8 HCAPLUS

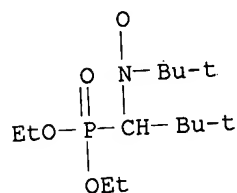
CN 3,7-Dioxa-4-aza-6-phosphanonanoic acid, 4,5-bis(1,1-dimethylethyl)-6-

ethoxy-2-methyl-, methyl ester, 6-oxide, (2R,5S)-rel- (9CI) (CA INDEX NAME)

Relative stereochemistry.



IT 188526-94-5P  
 RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)  
 (precursor; alkoxyamines derived from phosphorus-contg. nitroxides for initiators for radical polymn.)  
 RN 188526-94-5 HCAPLUS  
 CN Nitroxide, 1-(diethoxyphosphinyl)-2,2-dimethylpropyl 1,1-dimethylethyl (9CI) (CA INDEX NAME)



L32 ANSWER 43 OF 59 HCAPLUS COPYRIGHT 2003 ACS.  
 AN 2000:382170 HCAPLUS  
 DN 133:120724  
 TI Kinetics and Mechanism of Controlled **Free-Radical Polymerization** of Styrene and n-Butyl **Acrylate** in the Presence of an Acyclic .beta.-Phosphonylated Nitroxide  
 AU Benoit, Didier; Grimaldi, Sandra; Robin, Sophie; Finet, Jean-Pierre; Tordo, Paul; Gnanou, Yves  
 CS Laboratoire de Chimie des Polymeres Organiques, ENSCPB - Universite Bordeaux I, Talence, 33402, Fr.  
 SO Journal of the American Chemical Society (2000), 122(25), 5929-5939  
 CODEN: JACSAT; ISSN: 0002-7863  
 PB American Chemical Society  
 DT Journal  
 LA English  
 CC 35-3 (Chemistry of Synthetic High **Polymers**)  
 AB This study investigates the kinetics of **free radical polymn.** of styrene and Bu **acrylate** carried out in the presence of N-tert-butyl-N-[1-diethylphosphono-(2,2-dimethylpropyl)] nitroxide (DEPN). With this stable radical as chain growth moderator, it

- is demonstrated that the **polymn.** of these two monomers exhibits a controlled character. The mechanism of **polymn.** is essentially the same as that described for other "living"/controlled radical polymns.: the chains form a large pool of dormant species that can be reversibly activated, and only a minute fraction of them propagate at a given time. Using dilatometry and ESR, the evolution of the concn. of **polymeric** radicals and that of DEPN could be measured as a function of time. It appears that these DEPN-mediated polymns. are driven toward a pseudo-stationary state that is reached after an initial period of a few minutes. During this pseudo-stationary phase, the concn. of **polymeric** radicals and that of DEPN remained essentially const., which allowed us to det. the (K) equil. const. between dormant and active species and also the rate consts. of reversible activation (kd) and deactivation (krec) for each monomer. For purposes of comparison, a series of polymns. were simulated using the PREDICI package: both exptl. and simulated data were found to fall in rather good agreement.
- ST styrene butyl **acrylate** radical **polymn** kinetic mechanism; acyclic phosphonylated nitroxide radical **polymn** kinetic mechanism
- IT **Polymerization** kinetics  
(living, radical; kinetics and mechanism of controlled radical **polymn.** of styrene and Bu **acrylate** in the presence of acyclic phosphonylated nitroxide)
- IT 141-32-2 **188526-94-5**  
RL: MOA (Modifier or additive use); USES (Uses)  
(kinetics and mechanism of controlled radical **polymn.** of styrene and Bu **acrylate** in the presence of acyclic phosphonylated nitroxide)
- IT 100-42-5, Styrene, reactions  
RL: PRP (Properties); RCT (Reactant); RACT (Reactant or reagent)  
(kinetics and mechanism of controlled radical **polymn.** of styrene and Bu **acrylate** in the presence of acyclic phosphonylated nitroxide)

RE.CNT 72 THERE ARE 72 CITED REFERENCES AVAILABLE FOR THIS RECORD

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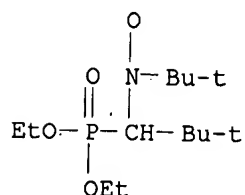
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IT 188526-94-5

RL: MOA (Modifier or additive use); USES (Uses)  
(kinetics and mechanism of controlled radical **polymn.** of  
styrene and Bu **acrylate** in the presence of acyclic  
phosphonylated nitroxide)

RN 188526-94-5 HCAPLUS

CN Nitroxide, 1-(diethoxyphosphinyl)-2,2-dimethylpropyl 1,1-dimethylethyl  
(9CI) (CA INDEX NAME)



- L32 ANSWER 44 OF 59 HCAPLUS COPYRIGHT 2003 ACS  
 AN 2000:282694 HCAPLUS  
 DN 133:43858  
 TI N-tert-Butyl-1-diethylphosphono-2,2-dimethylpropyl nitroxide as counter radical in the controlled free radical polymerization of styrene: kinetic aspects  
 AU Lacroix-Desmazes, Patrick; Lutz, Jean-Francois; Boutevin, Bernard  
 CS UMR 5076 (CNRS), Ecole Nationale Supérieure de Chimie de Montpellier, Montpellier, 34296, Fr.  
 SO Macromolecular Chemistry and Physics (2000), 201(6), 662-669  
 CODEN: MCHPES; ISSN: 1022-1352  
 PB Wiley-VCH Verlag GmbH  
 DT Journal  
 LA English  
 CC 35-3 (Chemistry of Synthetic High Polymers)  
 AB The controlled free radical polymn. of styrene with N-tert-butyl-1-diethylphosphono-2,2-dimethylpropyl nitroxide (DEPN) as counter radical was studied. Polymns. were performed in bulk, with a DEPN-capped polystyryl as alkoxyamine initiator, in the presence of an excess of DEPN nitroxyl free radicals. Kinetics of the polymn. were followed at 115, 125, and 130.degree.C. The equil. rate const.  $K = k_d/k_c$  of exchange between dormant and active species was detd. exptl. from the slope of  $\ln([styrene]_0/[styrene])$  vs. time. The obtained Arrhenius relation was the following:  $K(\text{mol} \cdot \text{cntdot} \cdot \text{L}^{-1}) = 1.45 \cdot \text{times} \cdot 10^7 \exp(-113.5 \text{ kJ} \cdot \text{cntdot} \cdot \text{mol}^{-1}/RT)$ , i.e.,  $K = 1.9 \cdot \text{times} \cdot 10^{-8} \text{ mol} \cdot \text{cntdot} \cdot \text{L}^{-1}$  at 125.degree.C. This result is consistent with a much faster polymn. of styrene with DEPN than with Tempo as nitroxyl counter radical ( $K = 2.1 \cdot \text{times} \cdot 10^{-11} \text{ mol} \cdot \text{cntdot} \cdot \text{L}^{-1}$  at 125.degree.C detd. previously by Fukuda).  
 ST styrene polymn kinetics nitroxide counter radical  
 IT Polymerization catalysts  
     (radical; nitroxide counter radical in controlled radical polymn. of styrene)  
 IT Polymerization kinetics  
     (radical; of styrene in presence of nitroxide counter radical)  
 IT 188526-94-5  
     RL: CAT (Catalyst use); USES (Uses)  
         (counter radical in controlled radical polymn. of styrene)  
 IT 78-67-1, AIBN 9003-53-6D, Polystyrene, nitroxy deriv.-terminated  
     RL: CAT (Catalyst use); USES (Uses)  
         (initiator in controlled radical polymn. of styrene)  
 IT 100-42-5, Styrene, reactions  
     RL: PRP (Properties); RCT (Reactant); RACT (Reactant or reagent)  
         (kinetics of controlled radical polymn. in presence of nitroxide counter radical)  
 IT 9003-53-6P, Polystyrene  
     RL: SPN (Synthetic preparation); PREP (Preparation)

(prepn. by controlled radical polymn. in presence of nitroxide counter radical)

RE.CNT 41 THERE ARE 41 CITED REFERENCES AVAILABLE FOR THIS RECORD  
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IT 188526-94-5

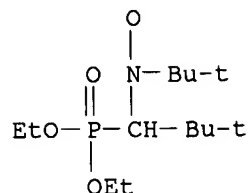
RL: CAT (Catalyst use); USES (Uses)

(counter radical in controlled radical polymn. of styrene)

RN 188526-94-5 HCAPLUS

CN Nitroxide, 1-(diethoxyphosphinyl)-2,2-dimethylpropyl 1,1-dimethylethyl  
(9CI) (CA INDEX NAME)





L32 ANSWER 45 OF 59 HCAPLUS COPYRIGHT 2003 ACS

AN 2000:240740 HCAPLUS

DN 132:265597

TI Radical **polymerization** in the presence of multiple stable **free radicals**

IN Senninger, Thierry; Robin, Sophie; Gnanou, Yves

PA Elf Atochem S.A., Fr.

SO Eur. Pat. Appl., 23 pp.

CODEN: EPXXDW

DT Patent

LA French

IC ICM C08F004-00

ICS C08F002-38; C08F293-00

CC 35-3 (Chemistry of Synthetic High **Polymers**)

FAN.CNT 2

|      | PATENT NO.  | KIND | DATE     | APPLICATION NO. | DATE     |
|------|---|------|----------|-----------------|----------|
| PI   | EP 992514   | A1   | 20000412 | EP 1999-118539  | 19990920 |
|      | R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO   |      |          |                 |          |
|      | FR 2784111  | A1   | 20000407 | FR 1998-12477   | 19981006 |
|      | KR 2000028845   | A    | 20000525 | KR 1999-42819   | 19991005 |
|      | JP 2000109512   | A2   | 20000418 | JP 1999-285329  | 19991006 |
|      | CN 1251841  | A    | 20000503 | CN 1999-123908  | 19991006 |
|      | US 6509428  | B1   | 20030121 | US 1999-413755  | 19991006 |
| PRAI | FR 1998-12477   | A    | 19981006 |                 |          |
| AB   | <p><b>Polymn.</b> of .gtoreq.1 monomer in the presence of .gtoreq.2 stable <b>free radicals</b> occurs synergistically; i.e., with greater productivity than the av. of the productivities obtained with each of the stable <b>free radicals</b> sep. Thus, <b>polymn.</b> of 3.45 .times. 10<sup>-2</sup> mol styrene at 125.degree. in the presence of AIBN 9 .times. 10<sup>-5</sup>, TEMPO 9 .times. 10<sup>-5</sup>, and Me3CN(O.cntdot.)CH(CMe3)P(O)(OEt)2 (DEPN) 9 .times. 10<sup>-5</sup> mol reached 70% conversion in 5 h, compared with 95% or 5%, resp., when the TEMPO was replaced by DEPN or vice versa. The polystyrene showed Mw/Mn 1.2 in each case. For <b>polymn.</b> of Bu <b>acrylate</b> initiated by the polystyrene formed as above, the conversion after 5 h was greater for the combination of DEPN and TEMPO than for either radical alone.</p> |      |          |                 |          |
| ST   | stable <b>free radical</b> effect <b>polymn</b> ;   |      |          |                 |          |
|      | synergistic effect stable <b>free radical</b>   |      |          |                 |          |
| IT   | <b>Polymerization</b>   |      |          |                 |          |
|      | (block, radical; radical <b>polymn.</b> in the presence of multiple stable <b>free radicals</b> )   |      |          |                 |          |
| IT   | <b>Polymerization</b>   |      |          |                 |          |
|      | (radical; radical <b>polymn.</b> in the presence of multiple stable <b>free radicals</b> )  |      |          |                 |          |
| IT   | Radicals, uses  |      |          |                 |          |

RL: CAT (Catalyst use); USES (Uses)  
(stable; radical polymn. in the presence of multiple stable  
free radicals)

IT 2154-68-9, 3-Carboxy-2,2,5,5-tetramethyl-1-pyrrolidinyloxy 2226-96-2,  
4-Hydroxy-2,2,6,6-tetramethyl-1-piperidinyloxy 2516-92-9 2564-83-2,  
TEMPO 2896-70-0, 2,2,6,6-Tetramethyl-4-oxo-1-piperidinyloxy 22690-04-6  
95407-69-5, 4-Methoxy-2,2,6,6-tetramethyl-1-piperidinyloxy  
188526-94-5 188707-72-4 258354-63-1  
261527-17-7 263355-91-5 263355-92-6  
RL: CAT (Catalyst use); USES (Uses)  
(radical polymn. in the presence of multiple stable  
free radicals)

IT 9003-53-6P, Polystyrene 110772-34-4P, Butyl acrylate-styrene  
block copolymer  
RL: IMF (Industrial manufacture); PREP (Preparation)  
(radical polymn. in the presence of multiple stable  
free radicals)

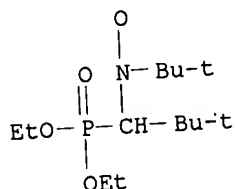
IT 78-67-1, AIBN  
RL: CAT (Catalyst use); USES (Uses)  
(radical polymn. in the presence of multiple stable  
free radicals and)

RE.CNT 9 THERE ARE 9 CITED REFERENCES AVAILABLE FOR THIS RECORD

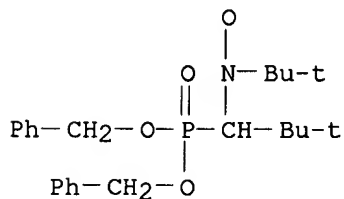
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IT 188526-94-5 188707-72-4 258354-63-1  
261527-17-7 263355-91-5 263355-92-6  
RL: CAT (Catalyst use); USES (Uses)  
(radical polymn. in the presence of multiple stable  
free radicals)

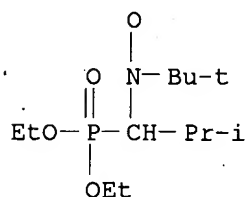
RN 188526-94-5 HCAPLUS  
CN Nitroxide, 1-(diethoxyphosphinyl)-2,2-dimethylpropyl 1,1-dimethylethyl  
(9CI) (CA INDEX NAME)



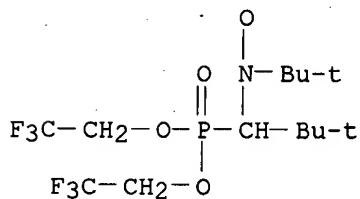
RN 188707-72-4 HCAPLUS  
CN Nitroxide, 1-[bis(phenylmethoxy)phosphinyl]-2,2-dimethylpropyl  
1,1-dimethylethyl (9CI) (CA INDEX NAME)



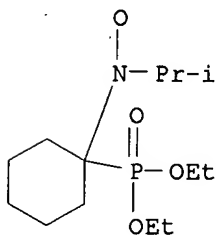
RN 258354-63-1 HCAPLUS  
 CN Nitroxide, 1-(diethoxyphosphinyl)-2-methylpropyl 1,1-dimethylethyl (9CI)  
 (CA INDEX NAME)



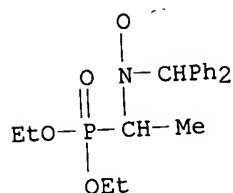
RN 261527-17-7 HCAPLUS  
 CN Nitroxide, 1-[bis(2,2,2-trifluoroethoxy)phosphinyl]-2,2-dimethylpropyl  
 1,1-dimethylethyl (9CI) (CA INDEX NAME)



RN 263355-91-5 HCAPLUS  
 CN Nitroxide, 1-(diethoxyphosphinyl)cyclohexyl 1-methylethyl (9CI) (CA INDEX  
 NAME)



RN 263355-92-6 HCAPLUS  
 CN Nitroxide, 1-(diethoxyphosphinyl)ethyl diphenylmethyl (9CI) (CA INDEX  
 NAME)



- L32 ANSWER 46 OF 59 HCAPLUS COPYRIGHT 2003 ACS  
 AN 2000:74962 HCAPLUS  
 DN 132:222921  
 TI Acyclic .beta.-Phosphonylated Nitroxides: A New Series of Counter-  
**Radicals for "Living"/Controlled Free Radical**  
**Polymerization**  
 AU Grimaldi, Sandra; Finet, Jean-Pierre; Le Moigne, Francois; Zeghdaoui,  
 Abdelhamid; Tordo, Paul; Benoit, Didier; Fontanille, Michel; Gnanou, Yves  
 CS Laboratoire Structure et Reactivite des Especes Paramagnetiques UMR 6517  
 Chimie Biologie et Radicaux Libres, CNRS Universites d'Aix-Marseille I et  
 III, Marseille, 13397, Fr.  
 SO Macromolecules (2000), 33(4), 1141-1147  
 CODEN: MAMOBX; ISSN: 0024-9297  
 PB American Chemical Society  
 DT Journal  
 LA English  
 CC 35-3 (Chemistry of Synthetic High Polymers)  
 AB Oxidn. of .alpha.-(N-alkylamino)phosphonic acid esters, carrying one or  
 two alkyl groups as substituents on their .alpha.-carbon, by  
 m-chloroperbenzoic acid afforded the corresponding stable  
 .beta.-phosphonylated nitroxides. The nitroxides derived from  
 .alpha.-mono-tert-Bu .alpha.-alkylaminophosphonic acid esters are stable  
 compds. despite the presence of a hydrogen atom on the .alpha.-carbon  
 bound to the nitroxyl group. The ESR study of these nitroxides in soln.  
 showed that this .beta.-hydrogen atom lies in the nodal plane to the  
 nitroxyl function. These .beta.-phosphonylated nitroxides efficiently  
 control the **free radical polymn.** reaction of  
 styrene, with a much faster rate of propagation than that obsd. in  
 TEMPO-mediated systems.  
 ST acyclic phosphonylated nitroxide counter radical living controlled polymn  
 IT ESR (electron spin resonance)  
**Polymerization catalysts**  
 (acyclic .beta.-phosphonylated nitroxides as counter-radicals  
 for living/controlled **free radical polymn**  
 .)  
 IT Nitroxides  
 RL: CAT (Catalyst use); USES (Uses)  
 (acyclic .beta.-phosphonylated nitroxides as counter-radicals  
 for living/controlled **free radical polymn**  
 .)  
 IT 188526-94-5P 188707-72-4P 258354-63-1P  
 261527-14-4P 261527-15-5P 261527-16-6P  
 261527-17-7P  
 RL: CAT (Catalyst use); SPN (Synthetic preparation); PREP (Preparation);  
 USES (Uses)  
 (acyclic .beta.-phosphonylated nitroxides as counter-radicals  
 for living/controlled **free radical polymn**  
 .)

- IT 9003-53-6P, Polystyrene  
 RL: PEP (Physical, engineering or chemical process); SPN (Synthetic preparation); PREP (Preparation); PROC (Process)  
 (acyclic .beta.-phosphonylated nitroxides as counter-radicals for living/controlled **free radical polymn**.)
- IT 227000-10-4P 258354-81-3P 258354-83-5P 261527-06-4P 261527-09-7P  
 261527-10-0P 261527-11-1P 261527-12-2P  
 RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)  
 (intermediate; acyclic .beta.-phosphonylated nitroxides as counter-radicals for living/controlled **free radical polymn.**)
- IT 75-07-0, Acetaldehyde, reactions 75-64-9, tert-Butylamine, reactions 630-19-3, Pivalaldehyde 13716-45-5, Diethyl trimethylsilyl phosphite 17176-77-1, Dibenzyl phosphite 92466-70-1, Bis(2,2,2-trifluoroethyl) phosphite  
 RL: RCT (Reactant); RACT (Reactant or reagent)  
 (starting material; acyclic .beta.-phosphonylated nitroxides as counter-radicals for living/controlled **free radical polymn.**)

RE.CNT 67. THERE ARE 67 CITED REFERENCES AVAILABLE FOR THIS RECORD  
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IT 188526-94-5P 188707-72-4P 258354-63-1P

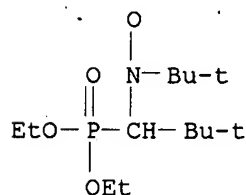
261527-14-4P 261527-15-5P 261527-17-7P

RL: CAT (Catalyst use); SPN (Synthetic preparation); PREP (Preparation);  
USES (Uses)

(acyclic .beta.-phosphonylated nitroxides as counter-radicals  
for living/controlled free radical polymn  
.)

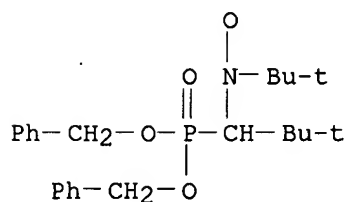
RN 188526-94-5 HCAPLUS

CN Nitroxide, 1-(diethoxyphosphinyl)-2,2-dimethylpropyl 1,1-dimethylethyl  
(9CI) (CA INDEX NAME)

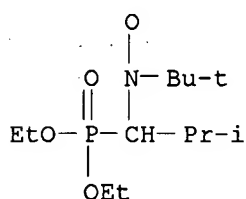


RN 188707-72-4 HCAPLUS

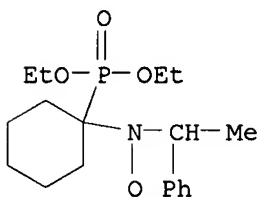
CN Nitroxide, 1-[bis(phenylmethoxy)phosphinyl]-2,2-dimethylpropyl  
1,1-dimethylethyl (9CI) (CA INDEX NAME)



RN 258354-63-1 HCAPLUS  
 CN Nitroxide, 1-(diethoxyphosphinyl)-2-methylpropyl 1,1-dimethylethyl (9CI)  
 (CA INDEX NAME)

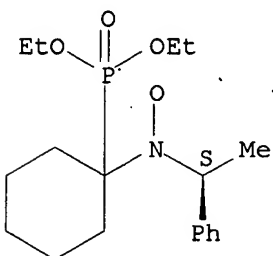


RN 261527-14-4 HCAPLUS  
 CN Nitroxide, 1-(diethoxyphosphinyl)cyclohexyl 1-phenylethyl (9CI) (CA INDEX NAME)

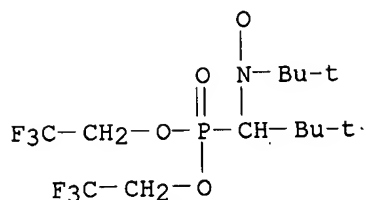


RN 261527-15-5 HCAPLUS  
 CN Nitroxide, 1-(diethoxyphosphinyl)cyclohexyl (1S)-1-phenylethyl (9CI) (CA INDEX NAME)

Absolute stereochemistry. Rotation (+).



RN 261527-17-7 HCAPLUS  
 CN Nitroxide, 1-[bis(2,2,2-trifluoroethoxy)phosphinyl]-2,2-dimethylpropyl 1,1-dimethylethyl (9CI) (CA INDEX NAME)



L32 ANSWER 47 OF 59 HCAPLUS COPYRIGHT 2003 ACS

AN 2000:34601 HCAPLUS

DN 132:79008

TI Emulsion **polymerization** in the presence of a stable **free radical**

IN Charleux, Bernadette; Lansalot, Muriel; Pirri, Rosangela; Vairon, Jean-Pierre; Denie, Sandrine

PA Elf Atochem S.A., Fr.

SO Eur. Pat. Appl., 21 pp.

CODEN: EPXXDW

DT Patent

LA French

IC ICM C08F004-00

ICS C08F002-38

CC 35-4 (Chemistry of Synthetic High **Polymers**)

FAN.CNT 1

|      | PATENT NO.  | KIND | DATE     | APPLICATION NO. | DATE     |
|------|---|------|----------|-----------------|----------|
| PI   | EP 970973   | A1   | 20000112 | EP 1999-112156  | 19990624 |
|      | R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO |      |          |                 |          |
|      | FR 2781486  | A1   | 20000128 | FR 1998-8916    | 19980710 |
|      | FR 2781486  | B1   | 20000908 |                 |          |
|      | FR 2781487  | A1   | 20000128 | FR 1999-3941    | 19990330 |
|      | FR 2781487  | B1   | 20001208 |                 |          |
|      | KR 2000011514   | A    | 20000225 | KR 1999-27050   | 19990706 |
|      | US 6353065  | B1   | 20020305 | US 1999-347573  | 19990706 |
|      | CN 1241577  | A    | 20000119 | CN 1999-111298  | 19990710 |
|      | JP 2000044610   | A2   | 20000215 | JP 1999-229995  | 19990712 |
| PRAI | FR 1998-8916  | A    | 19980710 |                 |          |
|      | FR 1999-3941  | A    | 19990330 |                 |          |

AB Radically **polymerizable** monomers are emulsion-**polymd.**

in the presence of stable **free radicals**, so that the aq. phase contains .gtoreq.50% water and the org. phase contains .ltoreq.50% monomer. This process gives polymers with low polydispersity and good linearity, and the manuf. of block polymers is possible. Thus, emulsion-**polymn.** of a mixt. contg. water 23.9, ethylene glycol (I) 71.7, Na styrenesulfonate 28.72, Na2HPO4 0.1835, 4,4'-azobis(cyano-4-pentanoic acid) 0.44, N-tert-butyl-1-diethylphosphono-2,2-dimethylpropyl nitroxide (II) 0.8, and NaOH 0.106 g 48 h at 125.degree. under N, and **polymn.** of a mixt. contg. water 7.5, I 22.5, resulting polymer 5, styrene 1, and II 0.8 g 24 h at 125.degree. gave a block copolymer.

ST emulsion block **polymn** stable **free radical**; styrenesulfonate emulsion block **polymn** tertiary butyldiethylphosphonodi methylpropyl nitroxide; tertiary



- butyldiethylphosphonodi methylpropylnitroxide emulsion block  
**polymn styrene**
- IT **Polymerization**  
 (block; emulsion **polymn.** in the presence of stable  
**free radicals**)
- IT Amine oxides  
 Radicals, uses  
 RL: NUU (Other use, unclassified); USES (Uses)  
 (emulsion **polymn.** in the presence of stable **free**  
**radicals**)
- IT **Polymerization**  
 (emulsion; emulsion **polymn.** in the presence of stable  
**free radicals**)
- IT 585-71-7, 1-Bromoethylbenzene  
 RL: RCT (Reactant); RACT (Reactant or reagent)  
 (alkoxylated **free radical** precursor; emulsion  
**polymn.** in the presence of stable **free**  
**radicals**)
- IT 9003-53-6P, Polystyrene 39307-76-1P, Sodium styrenesulfonate-styrene  
 copolymer 105935-35-1P, Butadiene-methyl **methacrylate**-styrene  
 block copolymer 106399-43-3P, Butadiene-methyl **methacrylate**  
 block copolymer 106911-77-7P, Methyl **methacrylate**-styrene  
 block copolymer 108501-19-5P, Butyl **acrylate**-methyl  
**methacrylate**-styrene block copolymer 110772-34-4P, Butyl  
**acrylate**-styrene block copolymer 119708-91-7P, 2-Ethylhexyl  
**acrylate**-styrene block copolymer 121917-49-5P, Ethyl  
**acrylate**-methyl **methacrylate** block copolymer  
 178034-20-3P, Sodium styrenesulfonate-styrene block copolymer  
 185510-41-2P, Perfluorooctyl **acrylate**-styrene block copolymer  
 254100-02-2P, 2-Hydroxyethyl **acrylate**-methyl  
**methacrylate**-styrene block copolymer 254100-03-3P, Methyl  
**methacrylate**-perfluorooctyl **acrylate** block copolymer  
 254100-04-4P, Behenyl **acrylate**-perfluorooctyl **acrylate**  
 block copolymer 254100-05-5P 254100-06-6P, Methyl **methacrylate**  
 -octyl **acrylate** block copolymer  
 RL: IMF (Industrial manufacture); PREP (Preparation)  
 (emulsion **polymn.** in the presence of stable **free**  
**radicals**)
- IT 188526-94-5  
 RL: NUU (Other use, unclassified); USES (Uses)  
 (emulsion **polymn.** in the presence of stable **free**  
**radicals**)
- IT 224575-62-6P  
 RL: IMF (Industrial manufacture); NUU (Other use, unclassified); PREP  
 (Preparation); USES (Uses)  
 (stable-**free-radical** generator; emulsion  
**polymn.** in the presence of stable **free**  
**radicals**)

RE.CNT 19 THERE ARE 19 CITED REFERENCES AVAILABLE FOR THIS RECORD  
 RE

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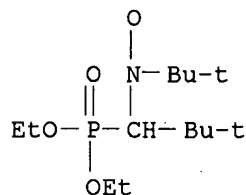
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IT 188526-94-5

RL: NUU (Other use, unclassified); USES (Uses)  
(emulsion **polymn.** in the presence of stable **free radicals**)

RN 188526-94-5 HCAPLUS

CN Nitroxide, 1-(diethoxyphosphinyl)-2,2-dimethylpropyl 1,1-dimethylethyl  
(9CI) (CA INDEX NAME)

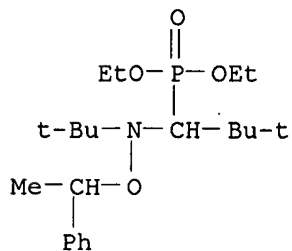


IT 224575-62-6P

RL: IMF (Industrial manufacture); NUU (Other use, unclassified); PREP  
(Preparation); USES (Uses)  
(stable-**free-radical** generator; emulsion  
**polymn.** in the presence of stable **free radicals**)

RN 224575-62-6 HCAPLUS

CN Phosphonic acid, [1-[(1,1-dimethylethyl)(1-phenylethoxy)amino]-2,2-dimethylpropyl]-, diethyl ester (9CI) (CA INDEX NAME)



L32 ANSWER 48 OF 59 HCAPLUS COPYRIGHT 2003 ACS

AN 1999:558862 HCAPLUS

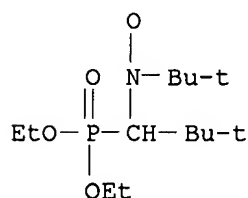
DN 132:152191

TI Polystyrene/polyacrylate block copolymer synthesis using an acyclic  
.beta.-phosphonylated nitroxide

AU Robin, Sophie; Gnanou, Yves

- CS Laboratoire de Chimie des Polymeres Organiques, ENSCPB-CNRS Universite  
Bordeaux, Talence, 33402, Fr.
- SO Polymer Preprints (American Chemical Society, Division of Polymer  
Chemistry) (1999), 40(2), 387-388  
CODEN: ACPPAY; ISSN: 0032-3934
- PB American Chemical Society, Division of Polymer Chemistry
- DT Journal
- LA English
- CC 35-3 (Chemistry of Synthetic High Polymers)
- AB Well defined Bu acrylate-styrene diblock copolymers could be synthesized  
in the presence of N-tert-butyl-N-[1-(diethylphosphono)-2,2-  
dimethylpropyl]nitroxide and AIBN by either order of addn. of monomers,  
provided that the exptl. conditions were finely tuned.
- ST styrene butyl **acrylate** block **polymn**; nitroxide chain  
growth controller block **polymn**
- IT Polymerization  
(block, living; using phosphonylated nitroxide as chain growth  
controller)
- IT Polymerization catalysts  
(block, radical; AIBN using phosphonylated nitroxide as chain growth  
controller)
- IT Polymerization  
(block, radical; using phosphonylated nitroxide as chain growth  
controller)
- IT Macromonomers  
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT  
(Reactant or reagent)  
(in radical block polymn. using phosphonylated nitroxide as chain  
growth controller)
- IT 78-67-1, AIBN  
RL: CAT (Catalyst use); USES (Uses)  
(catalyst for radical block **polymn.** of Bu **acrylate**  
with styrene)
- IT 110772-34-4P, Butyl acrylate-styrene block copolymer  
RL: SPN (Synthetic preparation); PREP (Preparation)  
(diblock; radical prepn. using phosphonylated nitroxide as chain growth  
controller)
- IT 188526-94-5  
RL: CAT (Catalyst use); USES (Uses)  
(radical block polymn. using phosphonylated nitroxide as chain growth  
controller)
- RE.CNT 10 THERE ARE 10 CITED REFERENCES AVAILABLE FOR THIS RECORD
- RE
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  - (2) Benoit, D; Controlled Radical Polymerization, Chapter 14, ACS Symposium  
Series 685 1998
  - (3) Benoit, D; Thesis, Bordeaux-I University 1997
  - (4) Georges, M; Macromolecules 1994, V27, P7228 HCAPLUS
  - (5) Georges, M; Polymer Prepr (Am Chem Soc, Div Polym Chem) 1994, V35, P870  
HCAPLUS
  - (6) Goto, A; Macromolecules 1997, V30, P4272 HCAPLUS
  - (7) Goto, A; Macromolecules 1999, V32, P618 HCAPLUS
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- IT 188526-94-5  
RL: CAT (Catalyst use); USES (Uses)  
(radical block polymn. using phosphonylated nitroxide as chain growth  
controller)

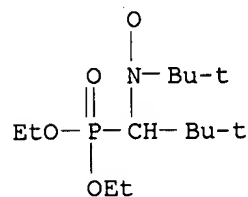
controller)  
 RN 188526-94-5 HCAPLUS  
 CN Nitroxide, 1-(diethoxyphosphinyl)-2,2-dimethylpropyl 1,1-dimethylethyl  
 (9CI) (CA INDEX NAME)



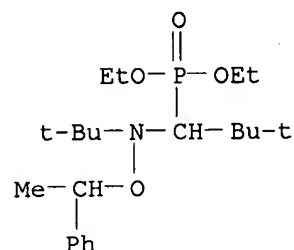
L32 ANSWER 49 OF 59 HCAPLUS COPYRIGHT 2003 ACS  
 AN 1999:558829 HCAPLUS  
 DN 132:152236  
 TI Controlled **free-radical polymerization** of  
 styrene in the presence of an alkoxyamine based on a .beta.-phosphonylated  
 nitroxyl radical: Comparison with bicomponent systems nitroxide/initiator  
 AU Lutz, Jean-Francois; Lacroix-Desmazes, Patrick; Boutevin, Bernard  
 CS UPRESA-CNRS, Montpellier, 34296, Fr.  
 SO Polymer Preprints (American Chemical Society, Division of Polymer  
 Chemistry) (1999), 40(2), 319-320  
 CODEN: ACPPAY; ISSN: 0032-3934  
 PB American Chemical Society, Division of Polymer Chemistry  
 DT Journal  
 LA English  
 CC 35-4 (Chemistry of Synthetic High **Polymers**)  
 AB Controlled radical **polymn.** has become a major aspect of polymer  
 synthesis. Stable **free radical polymn.**  
 (SFRP) using stable nitroxyl radicals is one of the most popular  
 techniques developed so far. Unimol. alkoxyamine or nitroxide/initiator  
 bicomponent systems can be used to obtain well defined polymers. A  
 comparison between the kinetic behavior as well as the living character of  
 the bulk **polymn.** of styrene for a monocomponent alkoxyamine  
 system (di-Et [1-[(1,1-dimethylethyl)(1-phenylethoxy)amino]-2,2-  
 dimethylpropyl]phosphonate (I)) and bicomponent peroxide  
 initiator/nitroxide (N-tert-butyl-1-diethylphosphono-2,2-dimethylpropyl  
 nitroxyl radical (II)) systems is presented. Very good control of the  
**polymn.** of styrene can be obtained using either I or a bicomponent  
 AIBN/II system even if the efficiency of initiation is a little bit lower  
 in the case of the bicomponent system. Moreover, the **polymn.**  
 rate is not zero order in I, indicating that the kinetic contribution of  
 thermal initiation is low. The use of benzoic anhydride as an  
 accelerating agent does not give any improvement in the systems.  
 ST radical **polymn** styrene phosphonylated nitroxyl radical; nitroxide peroxide  
 radical **polymn** styrene  
 IT **Polymerization**  
**Polymerization kinetics**  
 (radical; controlled **free-radical**  
**polymn.** of styrene in presence of alkoxyamine based on  
 .beta.-phosphonylated nitroxyl radical and bicomponent  
 nitroxide/peroxide initiator systems)  
 IT 9003-53-6P, Polystyrene  
 RL: SPN (Synthetic preparation); PREP (Preparation)

- (controlled **free-radical polymn.** of styrene in presence of alkoxyamine based on .beta.-phosphonylated nitroxyl radical and bicomponent nitroxide/initiator systems)
- IT 80-43-3, Dicumyl peroxide **188526-94-5 224575-62-6**  
 RL: CAT (Catalyst use); USES (Uses)  
 (controlled **free-radical polymn.** of styrene in presence of alkoxyamine based on .beta.-phosphonylated nitroxyl radical and bicomponent nitroxide/peroxide **initiator** systems)
- IT 93-97-0, Benzoic anhydride  
 RL: CAT (Catalyst use); USES (Uses)  
 (controlled **free-radical polymn.** of styrene in presence of alkoxyamine based on .beta.-phosphonylated nitroxyl radical and bicomponent nitroxide/peroxide initiator systems in relation to)
- IT 78-67-1, AIBN  
 RL: CAT (Catalyst use); USES (Uses)  
 (**polymn.** catalyst; controlled **free-radical polymn.** of styrene in presence of alkoxyamine based on .beta.-phosphonylated nitroxyl radical and bicomponent nitroxide/peroxide initiator systems)
- RE.CNT 29 THERE ARE 29 CITED REFERENCES AVAILABLE FOR THIS RECORD  
 RE
- (1) Benoit, D; Polym Prepr 1997, V38(1), P729 HCAPLUS
  - (2) Benoit, D; These de doctorat de l'Universite de Bordeaux I 1997
  - (3) Benoit, D; submitted
  - (4) Bertin, D; Polymers and surfaces A versatile combination 1998, P47 HCAPLUS
  - (5) Bertin, D; These de Doctorat de l'Universite Montpellier II 1997
  - (6) Chiefari, J; Macromolecules 1998, V31, P5559 HCAPLUS
  - (7) Devonport, W; Macromolecules 1997, V30, P1929 HCAPLUS
  - (8) Georges, M; Macromolecules 1993, V26, P2987 HCAPLUS
  - (9) Goto, A; Macromolecules 1997, V30, P4272 HCAPLUS
  - (10) Goto, A; Macromolecules 1997, V30, P4272 HCAPLUS
  - (11) Greszta, D; Macromolecules 1996, V29, P7661 HCAPLUS
  - (12) Grimaldi, S; Polym Prepr 1997, V38(1), P651 HCAPLUS
  - (13) Haddleton, D; Macromolecules 1997, V30, P2190 HCAPLUS
  - (14) Hawker, C; Macromolecules 1995, V28, P2993 HCAPLUS
  - (15) Hawker, C; Macromolecules 1996, V29, P5245 HCAPLUS
  - (16) Lacroix-Desmazes, P; submitted
  - (17) Lansalot, M; Polym Prepr, submitted 1999, V40(2) HCAPLUS
  - (18) Le Mercier, C; Polym Prepr, submitted 1999, V40(2)
  - (19) Lutz, J; submitted
  - (20) Malmstrom, E; Tetrahedron 1997, V53(45), P15225 HCAPLUS
  - (21) Matyjaszewski, K; Macromolecules 1998, V31, P5995
  - (22) Nobel, A; Technical Data
  - (23) Odian, G; La Polymerisation - Principes et applications Third Edition, Polytechnica 1994, P259
  - (24) Ohno, K; Macromolecules 1997, V30, P2503 HCAPLUS
  - (25) Otsu, T; Makromol Chem, Rapid Commun 1982, V3, P133 HCAPLUS
  - (26) Percec, V; Macromolecules 1997, V30, P6702 HCAPLUS
  - (27) Solomon, D; US 4581429 1986 HCAPLUS
  - (28) Uegaki, H; Macromolecules 1997, V30, P2249 HCAPLUS
  - (29) Wang, J; Macromolecules 1995, V28, P7901 HCAPLUS
- IT **188526-94-5 224575-62-6**  
 RL: CAT (Catalyst use); USES (Uses)  
 (controlled **free-radical polymn.** of styrene in presence of alkoxyamine based on .beta.-phosphonylated nitroxyl radical and bicomponent nitroxide/peroxide **initiator**

systems)  
 RN 188526-94-5 HCAPLUS  
 CN Nitroxide, 1-(diethoxyphosphinyl)-2,2-dimethylpropyl 1,1-dimethylethyl  
 (9CI) (CA INDEX NAME)

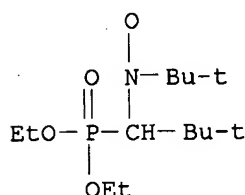


RN 224575-62-6 HCAPLUS  
 CN Phosphonic acid, [1-[(1,1-dimethylethyl)(1-phenylethoxy)amino]-2,2-dimethylpropyl]-, diethyl ester (9CI) (CA INDEX NAME)



L32 ANSWER 50 OF 59 HCAPLUS COPYRIGHT 2003 ACS  
 AN 1999:558828 HCAPLUS  
 DN 132:152182  
 TI Nitroxide-mediated controlled **free-radical** emulsion  
**polymerization** of styrene  
 AU Lansalot, M.; Charleux, B.; Vairon, J.-P.; Pirri, R.; Tordo, P.  
 CS Laboratoire de Chimie Macromoléculaire, Université Pierre et Marie Curie,  
 Paris, 75252, Fr.  
 SO Polymer Preprints (American Chemical Society, Division of Polymer  
 Chemistry) (1999), 40(2), 317-318  
 CODEN: ACPPAY; ISSN: 0032-3934  
 PB American Chemical Society, Division of Polymer Chemistry  
 DT Journal  
 LA English  
 CC 35-3 (Chemistry of Synthetic High **Polymers**)  
 Section cross-reference(s): 67  
 AB The N-tert-butyl-N-(1-diethylphosphono-2,2-dimethylpropyl) stable  
 nitroxide radical (SG1) was used to control the **free-**  
**radical polymn.** of styrene in an aq. medium. Batch  
 mini-emulsion and emulsion **polymn.** processes were used; the  
 initiators are AIBN and water sol. redox initiator K2S2O8 / Na2S2O5. One  
 of the advantages of a mini-emulsion process is that it enables to use  
 organosol. initiators, while maintaining small particle size. Various  
 initiating systems were used and the reaction temp. was 90-130.degree..  
 The kinetics and the evolution of mol. wt. vs. monomer conversion were  
 compared with those obsd. in bulk **polymn.**

- ST butyldiethylphosphonodimethylpropyl nitroxide radical control polymn  
styrene
- IT Particle size  
(butyldiethylphosphonodimethylpropyl nitroxide-mediated control of  
**free-radical** emulsion **polymn.** of styrene in  
aq. media)
- IT **Polymerization** catalysts  
(emulsion, radical; butyldiethylphosphonodimethylpropyl  
nitroxide-mediated control of **free-radical** emulsion  
**polymn.** of styrene in aq. media)
- IT 9003-53-6P, Polystyrene  
RL: SPN (Synthetic preparation); PREP (Preparation)  
(butyldiethylphosphonodimethylpropyl nitroxide-mediated control of  
**free-radical** emulsion **polymn.** of styrene in  
aq. media)
- IT 78-67-1, AIBN 7681-57-4, Sodium pyrosulfite (Na<sub>2</sub>S<sub>2</sub>O<sub>5</sub>) 7727-21-1  
RL: CAT (Catalyst use); USES (Uses)  
(radical **polymn.** catalyst; butyldiethylphosphonodimethylpropyl  
1 nitroxide-mediated control of **free-radical**  
emulsion **polymn.** of styrene in aq. media)
- IT **188526-94-5**  
RL: CAT (Catalyst use); USES (Uses)  
(radical **polymn.** control catalyst;  
butyldiethylphosphonodimethylpropyl nitroxide-mediated control of  
**free-radical** emulsion **polymn.** of styrene in  
aq. media)
- RE.CNT 7 THERE ARE 7 CITED REFERENCES AVAILABLE FOR THIS RECORD
- RE
- (1) Anon; ACS Symp Ser 1998, 685
  - (2) Benoit, D; ACS Symp Ser 1998, 685, P225
  - (3) Bon, S; Macromolecules 1997, V30, P324 HCAPLUS
  - (4) El-Aasser, M; 37th International Symposium on Macromolecules 1998
  - (5) Gabaston, L; Macromolecules 1998, V31, P2883 HCAPLUS
  - (6) Georges, M; Macromolecules 1993, V26, P2987 HCAPLUS
  - (7) Marestin, C; Macromolecules 1998, V31, P4041 HCAPLUS
- IT **188526-94-5**  
RL: CAT (Catalyst use); USES (Uses)  
(radical **polymn.** control catalyst;  
butyldiethylphosphonodimethylpropyl nitroxide-mediated control of  
**free-radical** emulsion **polymn.** of styrene in  
aq. media)
- RN 188526-94-5 HCAPLUS
- CN Nitroxide, 1-(diethoxyphosphinyl)-2,2-dimethylpropyl 1,1-dimethylethyl  
(9CI) (CA INDEX NAME)



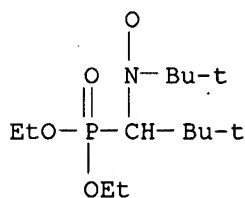
L32 ANSWER 51 OF 59 HCAPLUS COPYRIGHT 2003 ACS  
AN 1999:558826 HCAPLUS

KATHLEEN FULLER EIC 1700/PARKER LAW 308-4290

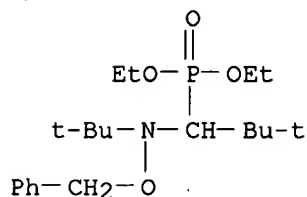
- DN 132:152181
- TI Characteristics of phosphonylated nitroxides and alkoxyamines used in controlled/ "living" radical polymerizations
- AU Le Mercier, C.; Gaudel, A.; Siri, D.; Tordo, P.; Marque, S.; Martschke, R.; Fischer, H.
- CS Laboratoire Structure et Reactivite des Espaces Paramagnetiques, CNRS et Universites d'Aix-Marseille, Marseille, 13397, Fr.
- SO Polymer Preprints (American Chemical Society, Division of Polymer Chemistry) (1999), 40(2), 313-314  
CODEN: ACPPAY; ISSN: 0032-3934
- PB American Chemical Society, Division of Polymer Chemistry
- DT Journal
- LA English
- CC 35-3 (Chemistry of Synthetic High **Polymers**)  
Section cross-reference(s): 67
- AB The kinetic parameters were detd. of the reversible cleavage of alkoxyamines obtained by trapping the 1-phenyl-Et radical with TEMPO and N-tert-butyl-N-(1-diethylphosphono-2,2-dimethylpropyl) nitroxide [t-BuN(O)CH(t-Bu)P(O)(OEt)2]. The alkoxyamines are derivs. of the N-tert-Butyl-1-diethylphosphono-2,2-dimethylpropyl nitroxyl radical, e.g., 2,2,6,6-Tetramethyl-1-(1-phenylethoxy)piperidine (I) and [1-[(1,1-dimethylethyl)(1-phenylethoxy)amino]-2,2-dimethylpropyl] di-Et phosphonate (II). The equil. const. (K<sub>eq</sub>) is much larger (460 times) for II than for I. The x-ray structure of I and II and the BDE [bond dissocn. energy] of the NO-C bond were detd.
- ST phosphonyl nitroxide radical structure dissocn energy; radical **polymn** control nitroxyl alkoxyamine reversible cleavage; styrene **acrylate** radical **polymn** control alkoxyamine cleavage
- IT Bond cleavage  
(cleavage kinetics and structure of phosphonylated nitroxides and alkoxyamines controlling radical **polymn.** mechanisms)
- IT Bond energy  
(dissocn.; cleavage kinetics and structure of phosphonylated nitroxides and alkoxyamines controlling radical **polymn.** mechanisms)
- IT Polymerization catalysts  
(living, radical; cleavage kinetics and structure of phosphonylated nitroxides and alkoxyamines controlling radical **polymn.** mechanisms)
- IT 78-67-1, AIBN  
RL: CAT (Catalyst use); USES (Uses)  
(cleavage kinetics and structure of phosphonylated nitroxides and alkoxyamines controlling radical **polymn.** mechanisms)
- IT 2564-83-2, TEMPO 102261-92-7, N-Benzyloxy-2,2,6,6-tetramethylpiperidine 154554-67-3, 2,2,6,6-Tetramethyl-1-(1-phenylethoxy)piperidine 157462-14-1 **188526-94-5**, N-tert-Butyl-1-diethylphosphono-2,2-dimethylpropyl nitroxyl radical **224575-61-5** **224575-62-6**  
RL: **CAT (Catalyst use)**; PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)  
(cleavage kinetics and structure of phosphonylated nitroxides and alkoxyamines controlling radical **polymn.** mechanisms)
- IT 9003-53-6P, Polystyrene  
RL: SPN (Synthetic preparation); PREP (Preparation)  
(cleavage kinetics and structure of phosphonylated nitroxides and alkoxyamines controlling radical **polymn.** mechanisms)
- RE.CNT 25 THERE ARE 25 CITED REFERENCES AVAILABLE FOR THIS RECORD
- RE
- (1) Anon; ACS Symp Ser 1998, V685
- (2) Benoit, D; ACS Polymer Preprint 1997, V38(1), P729 HCAPLUS
- (3) Benoit, D; Controlled Radical Polymerization 1998, V685, P225 HCAPLUS



- (4) Catala, J; Macromolecules 1995, V28, P8441 HCAPLUS  
 (5) Fischer, H; Macromolecules 1997, V30, P5666 HCAPLUS  
 (6) Fukuda, T; Chem Lett 1996, V4, P293  
 (7) Fukuda, T; Macromolecules 1996, V29, P6393 HCAPLUS  
 (8) Georges, M; Macromolecules 1993, V26, P2987 HCAPLUS  
 (9) Georges, M; Macromolecules 1994, V27, P7228 HCAPLUS  
 (10) Greszta, D; Macromolecules 1996, V29, P5239 HCAPLUS  
 (11) Greszta, D; Macromolecules 1996, V29, P7661 HCAPLUS  
 (12) Greszta, D; Polym Sci A: Polym Chem 1997, V35, P1857 HCAPLUS  
 (13) Grimaldi, S; WO 9624620 1996 HCAPLUS  
 (14) Grimaldi, S; ACS Polymer Preprint 1997, V38(1), P651 HCAPLUS  
 (15) Hawker, C; Acc Chem Res 1997, V30, P373 HCAPLUS  
 (16) Kazmaier, P; Macromolecules 1995, V28, P1841 HCAPLUS  
 (17) Keoshkerian, B; Macromolecules 1998, V31, P7555  
 (18) Kothe, T; J Chem Soc, Perkin Trans 2 1998, P1553 HCAPLUS  
 (19) Le Mercier, C; Polym Prepr 1999, V40(2)  
 (20) Lutz, J; Polym Prepr 1999, V40(2) HCAPLUS  
 (21) Malmstrom, E; Tetrahedron 1997, V45, P15225  
 (22) Marsal, P; J Phys Chem A in press 1999  
 (23) Puts, R; Macromolecules 1996, V29, P3323 HCAPLUS  
 (24) Skene, W; Macromolecules 1998, V31, P9103 HCAPLUS  
 (25) Solomon, D; US 4581429 1986 HCAPLUS  
 IT 188526-94-5, N-tert-Butyl-1-diethylphosphono-2,2-dimethylpropyl  
 nitroxyl radical 224575-61-5 224575-62-6  
 RL: CAT (Catalyst use); PEP (Physical, engineering or chemical  
 process); PROC (Process); USES (Uses)  
 (cleavage kinetics and structure of phosphonylated nitroxides and  
 alkoxyamines controlling radical polymn. mechanisms)  
 RN 188526-94-5 HCAPLUS  
 CN Nitroxide, 1-(diethoxyphosphinyl)-2,2-dimethylpropyl 1,1-dimethylethyl  
 (9CI) (CA INDEX NAME)

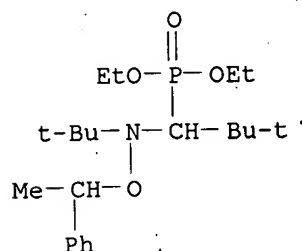


- RN 224575-61-5 HCAPLUS  
 CN Phosphonic acid, [1-[(1,1-dimethylethyl)(phenylmethoxy)amino]-2,2-dimethylpropyl]-, diethyl ester (9CI) (CA INDEX NAME)



- RN 224575-62-6 HCAPLUS  
 CN Phosphonic acid, [1-[(1,1-dimethylethyl)(1-phenylethoxy)amino]-2,2-

dimethylpropyl]-, diethyl ester (9CI) (CA INDEX NAME)



L32 ANSWER 52 OF 59 HCAPLUS COPYRIGHT 2003 ACS

AN 1999:237002 HCAPLUS

DN 130:297115

TI Graft copolymer obtained by **free-radical polymerization** with stable **free radicals**, its preparation and uses

IN Bertin, Denis; Boutevin, Bernard; Robin, Jean-Jacques

PA Elf Atochem S.A., Fr.

SO Eur. Pat. Appl., 17 pp.

CODEN: EPXXDW

DT Patent

LA French

IC ICM C08L051-00

ICS C08F291-00; C08F291-18; C08F004-36

CC 35-4 (Chemistry of Synthetic High **Polymers**)

FAN.CNT 1

|      | PATENT NO.   | KIND | DATE     | APPLICATION NO. | DATE     |
|------|--|------|----------|-----------------|----------|
| PI   | EP 906937  | A1   | 19990407 | EP 1998-402420  | 19981001 |
|      | R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO  |      |          |                 |          |
|      | FR 2769316   | A1   | 19990409 | FR 1997-12341   | 19971003 |
|      | FR 2769316   | B1   | 19991203 |                 |          |
|      | JP 11171946  | A2   | 19990629 | JP 1998-279874  | 19981001 |
|      | US 6335401   | B1   | 20020101 | US 1998-164717  | 19981001 |
|      | CA 2246653   | AA   | 19990403 | CA 1998-2246653 | 19981002 |
| PRAI | FR 1997-12341  | A    | 19971003 |                 |          |
| AB   | A graft copolymer, useful as a compatibilizer, an emulsifier, or an adhesive, is prepd. by reaction of a polymer having (hydro)peroxide substituents and/or peroxide crosslinks with .gtoreq.1 monomer in the presence of a stable free radical which acts to terminate the grafted chains. Thus, a low-d. polyethylene with no.-av. mol. wt. 10,000 was treated with O3 at 40.degree. to introduce 10-5 mol peroxide groups per g, and this was heated with styrene for 20 h at 125.degree. in the presence of 2,2,6,6-tetramethyl-1-piperidinyloxy to give a graft copolymer contg. 60 wt.% styrene, together with a lesser amt. of polystyrene, which was removed by extn. in cold xylene and by pptn. of the graft copolymer from acetone. |      |          |                 |          |
| ST   | ethylene styrene graft copolymer manuf; graft copolymn stable free radical; peroxide functional polymer grafting   |      |          |                 |          |
| IT   | Polymer blend compatibilizers<br>(graft copolymer prepn. as compatibilizer for polymer blends)   |      |          |                 |          |
| IT   | <b>Polymerization</b>  |      |          |                 |          |

(graft; graft copolymer prepn. by **free-radical**  
**polymn.** in presence of stable **free radicals**  
 )

IT Ozonization  
 (in graft copolymer prepn. by **free-radical**  
**polymn.** in presence of stable **free radicals**  
 )

IT Radicals, reactions  
 RL: RCT (Reactant); RACT (Reactant or reagent)  
 (stable; graft copolymer prepn. by **free-radical**  
**polymn.** in presence of)

IT 9002-88-4 9003-53-6  
 RL: POF (Polymer in formulation); PRP (Properties); USES (Uses)  
 (graft copolymer prepn. as compatibilizer for polymer blends contg.)  
 IT 2564-83-2, 2,2,6,6-Tetramethyl-1-piperidinyloxy 3229-53-6,  
 2,2,5,5-Tetramethyl-1-pyrrolidinyloxy 61015-94-9 **188526-94-5**  
**188707-72-4** 200345-02-4 **200345-03-5**  
**200345-05-7**

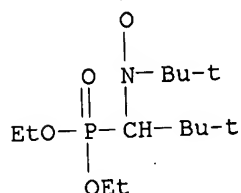
RL: RCT (Reactant); RACT (Reactant or reagent)  
 (graft copolymer prepn. by **free-radical**  
**polymn.** in presence of)  
 IT 106826-12-4P, Ethylene-styrene graft copolymer  
 RL: IMF (Industrial manufacture); TEM (Technical or engineered material  
 use); PREP (Preparation); USES (Uses)  
 (graft copolymer prepn. by **free-radical**  
**polymn.** in presence of stable **free radicals**  
 )

RE.CNT 4 THERE ARE 4 CITED REFERENCES AVAILABLE FOR THIS RECORD

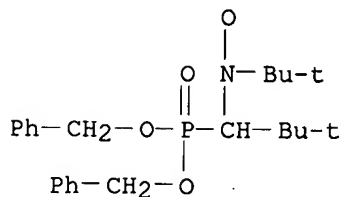
- RE  
 (1) Anon; EP 0906937 A1 HCAPLUS  
 (2) Atochem Elf Sa; EP 0726280 A 1996 HCAPLUS  
 (3) Buna, A; DD 294493 A 1983 HCAPLUS  
 (4) Natta, G; US 3288739 A 1966

IT **188526-94-5** **188707-72-4** **200345-03-5**  
**200345-05-7**  
 RL: RCT (Reactant); RACT (Reactant or reagent)  
 (graft copolymer prepn. by **free-radical**  
**polymn.** in presence of)

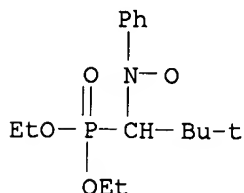
RN 188526-94-5 HCAPLUS  
 CN Nitroxide, 1-(diethoxyphosphinyl)-2,2-dimethylpropyl 1,1-dimethylethyl  
 (9CI) (CA INDEX NAME)



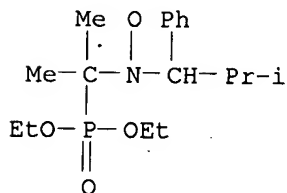
RN 188707-72-4 HCAPLUS  
 CN Nitroxide, 1-[bis(phenylmethoxy)phosphinyl]-2,2-dimethylpropyl  
 1,1-dimethylethyl (9CI) (CA INDEX NAME)



RN 200345-03-5 HCAPLUS  
 CN Nitroxide, 1-(diethoxyphosphinyl)-2,2-dimethylpropyl phenyl (9CI) (CA INDEX NAME)



RN 200345-05-7 HCAPLUS  
 CN Nitroxide, 1-(diethoxyphosphinyl)-1-methylethyl 2-methyl-1-phenylpropyl (9CI) (CA INDEX NAME)



L32 ANSWER 53 OF 59 HCAPLUS COPYRIGHT 2003 ACS  
 AN 1999:234532 HCAPLUS  
 DN 131:45141  
 TI Development of a Universal Alkoxyamine for "Living" **Free Radical Polymerizations**  
 AU Benoit, Didier; Chaplinski, Vladimir; Braslau, Rebecca; Hawker, Craig J.  
 CS NSF Center for Polymeric Interfaces and Macromolecular Assemblies, IBM Almaden Research Center, San Jose, CA, 95120-6099, USA  
 SO Journal of the American Chemical Society (1999), 121(16), 3904-3920  
 CODEN: JACSAT; ISSN: 0002-7863  
 PB American Chemical Society  
 DT Journal  
 LA English  
 CC 35-3 (Chemistry of Synthetic High **Polymers**)  
 AB Examn. of novel alkoxyamines has demonstrated the pivotal role that the nitroxide plays in mediating the "living" or controlled **polymn.** of a wide range of vinyl monomers. Surveying a variety of different alkoxyamine structures led to .alpha.-hydrido derivs. based on a 2,2,5-trimethyl-4-phenyl-3-azahexane-3-oxy, 1, skeleton which were able to

control the **polymn.** of styrene, **acrylate**, **acrylamide**, and **acrylonitrile** based monomers. For each monomer set, the mol. wt. could be controlled from 1000 to 200,000 amu with polydispersities typically 1.05-1.15. Block and random copolymers based on combinations of the above monomers could also be prep'd. with similar control. In comparison with 2,2,6,6-tetramethylpiperidinoxy (TEMPO), these new systems represent a dramatic increase in the range of monomers that can be **polymd.** under controlled conditions and overcome many of the limitations assoc'd. with nitroxide-mediated "living" **free radical** procedures. Monomer selection and functional group compatibility now approach those of ATRP-based systems.

ST alkoxyamine mediated living radical **polymn** styrene  
**acrylate**; catalyst alkoxyamine living radical **polymn**  
 styrene **acrylate**  
 IT Amines, preparation  
 RL: CAT (Catalyst use); SPN (Synthetic preparation); PREP (Preparation);  
 USES (Uses)

(alkoxy; alkoxyamine-mediated living **free radical**  
**polymn.** of styrene and **acrylic** compds.)  
 IT Polymerization  
 Polymerization catalysts  
 (living, **radical**; alkoxyamine-mediated living **free**  
**radical polymn.** of styrene and **acrylic**  
 compds.)

IT 132416-36-5 154554-67-3 183194-54-9 188491-78-3 219908-58-4  
 219908-68-6 224575-62-6 224967-65-1 227000-59-1  
 227000-69-3 227000-79-5 227000-80-8 227000-81-9 227000-83-1  
 227000-84-2 227000-85-3 227000-86-4 227000-87-5 227000-88-6  
 227000-89-7 227000-90-0

RL: CAT (Catalyst use); USES (Uses)  
 (alkoxyamine-mediated living **free radical**  
**polymn.** of styrene and **acrylic** compds.)

IT 9003-49-0P, Poly(n-butyl **acrylate**) 9003-53-6P, Polystyrene  
 9003-54-7P, **Acrylonitrile**-styrene copolymer 25014-41-9P,  
**Acrylonitrile** homopolymer 25034-86-0P, Methyl  
**methacrylate**-styrene copolymer 25119-83-9P, **Acrylic**  
 acid-butyl **acrylate** copolymer 25567-76-4P,  
**Acrylonitrile**-butyl **acrylate** copolymer 25767-47-9P,  
 n-Butyl **acrylate**-styrene copolymer 26222-39-9P,  
 2-(N,N-Dimethylamino)ethyl **methacrylate**-styrene copolymer  
 26793-34-0P, N,N-Dimethylacrylamide homopolymer 29760-26-7P,  
 N,N-Dimethylacrylamide-styrene copolymer 32409-50-0P, Butyl  
**acrylate**-2-hydroxyethyl **acrylate** copolymer  
 33775-27-8P, Butyl **acrylate**-2-(2-methoxyethoxy)ethyl  
**acrylate** copolymer 50733-27-2P, Butyl **acrylate**-N,N-  
 dimethylacrylamide copolymer 64171-34-2P, Butyl **acrylate**  
 -glycidyl **acrylate** copolymer 106392-91-0P,  
 2,2,3,3,4,4,4-Heptafluorobutyl **acrylate**-styrene copolymer  
 110772-34-4P, Butyl **acrylate**-styrene block copolymer  
 226999-65-1P, Butyl **acrylate**-2,2,3,3,4,4,4-heptafluorobutyl  
**acrylate** copolymer

RL: SPN (Synthetic preparation); PREP (Preparation)  
 (alkoxyamine-mediated living **free radical**  
**polymn.** of styrene and **acrylic** compds.)

IT 75-77-4, reactions 76-39-1 78-84-2, Isobutyraldehyde 79-46-9,  
 2-Nitropropane 108-86-1, Phenyl bromide, reactions 344-04-7,  
 Bromopentafluorobenzene 402-43-7, p-Trifluoromethylphenyl bromide  
 554-12-1, Methyl propionate 585-71-7, 1-Bromoethylbenzene 594-70-7,

2-Methyl-2-nitropropane 630-19-3, Pivalaldehyde 762-04-9, Diethyl phosphite 937-14-4, m-Chloroperbenzoic acid 1432-48-0 1592-20-7, p-Vinylbenzyl chloride 2154-70-3 16302-61-7 174153-12-9 175093-20-6 182190-80-3

RL: RCT (Reactant); RACT (Reactant or reagent)  
(in alkoxyamine prepn.; alkoxyamine-mediated living free radical polymn. of styrene and acrylic compds.)

IT 53544-93-7P 56859-56-4P 61015-94-9P 72331-68-1P 85664-55-7P  
140116-61-6P 140116-62-7P 188526-94-5P 226999-86-6P  
226999-92-4P 226999-99-1P 227000-10-4P 227000-16-0P 227000-22-8P  
227000-39-7P 227000-46-6P

RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)  
(in alkoxyamine prepn.; alkoxyamine-mediated living free radical polymn. of styrene and acrylic compds.)

RE.CNT 101 THERE ARE 101 CITED REFERENCES AVAILABLE FOR THIS RECORD

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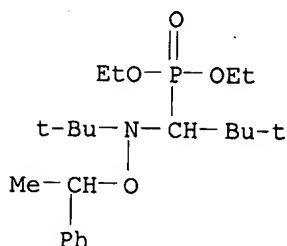
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IT 224575-62-6

RL: CAT (Catalyst use); USES (Uses)  
 (alkoxyamine-mediated living **free radical**  
**polymn.** of styrene and **acrylic** compds.)

RN 224575-62-6 HCAPLUS

CN Phosphonic acid, [1-[(1,1-dimethylethyl)(1-phenylethoxy)amino]-2,2-dimethylpropyl]-, diethyl ester (9CI) (CA INDEX NAME)

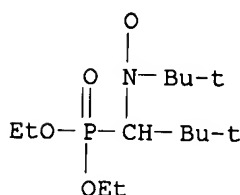


IT 188526-94-5P

RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT  
 (Reactant or reagent)  
 (in alkoxyamine prepn.; alkoxyamine-mediated living **free**  
**radical polymn.** of styrene and **acrylic**  
 compds.)

RN 188526-94-5 HCAPLUS

CN Nitroxide, 1-(diethoxyphosphinyl)-2,2-dimethylpropyl 1,1-dimethylethyl  
 (9CI) (CA INDEX NAME)



L32 ANSWER 54 OF 59 HCAPLUS COPYRIGHT 2003 ACS

AN 1998:111881 HCAPLUS

DN 128:141095

TI Controlled/living **free-radical polymerization**  
 of styrene and n-butyl **acrylate** in the presence of a novel  
 asymmetric nitroxyl radical

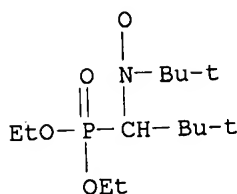
AU Benoit, D.; Grimaldi, S.; Finet, J. P.; Tordo, P.; Fontanille, M.; Gnanou,  
 Y.

CS Laboratoire de Chimie des Polymeres Organiques UMR Centre National de la  
 Recherche Scientifique, Ecole Nationale Supérieure de Chimie et de  
 Physique de Bordeaux, Université Bordeaux I, Talence, 33402, Fr.



- SO ACS Symposium Series (1998), 685(Controlled Radical Polymerization), 225-235  
CODEN: ACSMC8; ISSN: 0097-6156
- PB American Chemical Society
- DT Journal
- LA English
- CC 35-3 (Chemistry of Synthetic High Polymers)
- AB A novel nitroxyl radical contg. a di-Et phosphonate group in the .beta.-position to the nitrogen atom has been used as **radical scavenger** in **free radical polymn.** In the presence of this stable **free-radical**, styrene and Bu **acrylate** undergo controlled living **polymn.** The samples of polystyrene and poly (Bu **acrylate**) obtained exhibit a narrow Poisson-type distribution of molar masses.
- ST living radical **polymn** styrene butyl **acrylate**;  
phosphonate nitroxyl radical **polymn** styrene **acrylate**
- IT **Polymerization catalysts**  
**Polymerization catalysts**  
(living, **radical**; controlled living **free-radical polymn.** of styrene and Bu **acrylate** in presence of di-Et phosphonate group-contg. nitroxyl radical)
- IT 188526-94-5, N-tert-Butyl-1-diethylphosphono-2,2-dimethylpropyl nitroxyl **radical**  
RL: CAT (Catalyst use); USES (Uses)  
(controlled living **free-radical polymn.** of styrene and Bu **acrylate** in presence of di-Et phosphonate group-contg. nitroxyl radical)
- IT 9003-49-0P, Poly(butyl **acrylate**) 9003-53-6P, Polystyrene  
RL: SPN (Synthetic preparation); PREP (Preparation)  
(controlled living **free-radical polymn.** of styrene and Bu **acrylate** in presence of di-Et phosphonate group-contg. nitroxyl radical)
- RE.CNT 24 THERE ARE 24 CITED REFERENCES AVAILABLE FOR THIS RECORD
- RE
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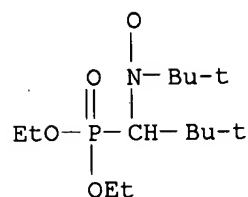
IT 188526-94-5, N-tert-Butyl-1-diethylphosphono-2,2-dimethylpropyl  
nitroxyl radical  
RL: CAT (Catalyst use); USES (Uses)  
(controlled living free-radical polymn.  
of styrene and Bu acrylate in presence of di-Et phosphonate  
group-contg. nitroxyl radical)  
RN 188526-94-5 HCAPLUS  
CN Nitroxide, 1-(diethoxyphosphinyl)-2,2-dimethylpropyl 1,1-dimethylethyl  
(9CI) (CA INDEX NAME)



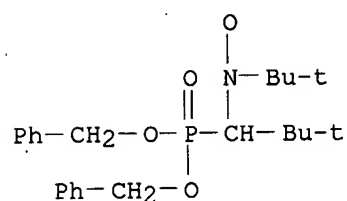
L32 ANSWER 55 OF 59 HCAPLUS COPYRIGHT 2003 ACS  
AN 1998:1511 HCAPLUS  
DN 128:61941  
TI Preparing telechelic 1,3-diene oligomers by controlled free  
radical polymerization of 1,3-dienes in the presence of  
a stable free radical  
IN Boutevin, Bernard; Cerf, Martine; Pradel, Jean-Laurent  
PA Elf Atochem S.A., Fr.; Boutevin, Bernard; Cerf, Martine; Pradel,  
Jean-Laurent  
SO PCT Int. Appl., 27 pp.  
CODEN: PIXXD2  
DT Patent  
LA French  
IC ICM C08F004-28  
ICS C08F002-38; C08F136-04  
CC 35-4 (Chemistry of Synthetic High Polymers)  
FAN.CNT 1

| PATENT NO.  | KIND | DATE     | APPLICATION NO. | DATE     |
|---|------|----------|-----------------|----------|
| WO 9746593  | A1   | 19971211 | WO 1997-FR973   | 19970603 |
| W: AL, AM, AT, AU, AZ, BB, BG, BR, BY, CA, CH, CN, CZ, DE, DK, EE,<br>ES, FI, GB, GE, HU, IL, IS, JP, KE, KG, KP, KR, KZ, LK, LR, LS,<br>LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD,<br>SE, SG, SI, SK, TJ, TM, TR, TT, UA, UG, US, UZ, VN, AM, AZ, BY,<br>KG, KZ, MD, RU, TJ, TM<br>RW: GH, KE, LS, MW, SD, SZ, UG, AT, BE, CH, DE, DK, ES, FI, FR, GB,<br>GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN,<br>ML, MR, NE, SN, TD, TG |      |          |                 |          |
| CA 2229978  | AA   | 19971211 | CA 1997-2229978 | 19970603 |
| AU 9730982  | A1   | 19980105 | AU 1997-30982   | 19970603 |
| EP 842198   | A1   | 19980520 | EP 1997-926089  | 19970603 |
| R: DE, FR, GB, IT   |      |          |                 |          |
| CN 1198750  | A    | 19981111 | CN 1997-191040  | 19970603 |
| BR 9702291  | A    | 19990720 | BR 1997-2291    | 19970603 |
| JP 11511202   | T2   | 19990928 | JP 1997-500271  | 19970603 |
| PRAI FR 1996-6875   | A    | 19960604 |                 |          |
| WO 1997-FR973   | W    | 19970603 |                 |          |

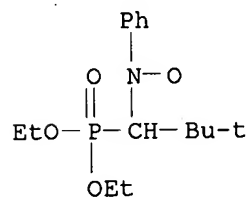
- AB The free radical polymn. of .gtoreq.1  
1,3-diene with a heat-sensitive polymn. initiator such as H2O2  
or an azodinitrile in the presence of a stable nitroxide radical yields  
telechelic 1,3-diene oligomers, which can be used in the prepn. of block  
copolymers. Thus, 1 mol butadiene was introduced into a reactor contg.  
30% H2O2 9.07, 2,2,6,6-tetramethylpiperidinyloxy 1.88, and iso-PROH 33.7 g  
at -40.degree., and the reactor was heated at 130.degree. for 4 h to give  
HO- and tetramethylpiperidinyloxy-terminated polybutadiene with 80% 1,4-  
and 20% 1,2-structure and no.-av. mol. wt. 1700. Heating this product  
with Zn powder in AcOH gave a hydroxy-terminated polybutadiene of no.-av.  
mol. wt. 1700 and functionality 2, whereas polymn. with H2O2 in  
the absence of the nitroxide led to higher mol. wt. and functionality  
2.35.
- ST butadiene oligomerization nitroxide radical; telechelic polybutadiene  
prepn oligomeric
- IT Polymerization  
(oligomerization; prepn. of telechelic diene oligomers)
- IT Polyurethanes, preparation  
RL: PNU (Preparation, unclassified); PREP (Preparation)  
(polybutadiene-; prepn. and reaction of telechelic diene oligomers)
- IT Nitroxides  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(stable; in prepn. of telechelic diene oligomers)
- IT 106107-54-4P, Butadiene-styrene block copolymer  
RL: IMF (Industrial manufacture); PREP (Preparation)  
(diblock; prepn. and reaction of telechelic diene oligomers)
- IT 2564-83-2, 2,2,6,6-Tetramethylpiperidinyloxy 3229-53-6,  
2,2,5,5-Tetramethylpyrrolidinyloxy 61015-94-9 188526-94-5  
188707-72-4 200345-02-4 200345-03-5 200345-04-6  
200345-05-7  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(in prepn. of telechelic diene oligomers)
- IT 78-67-1, AIBN 7722-84-1, Hydrogen peroxide (H2O2), uses  
RL: CAT (Catalyst use); USES (Uses)  
(initiator; in prepn. of telechelic diene oligomers)
- IT 9003-17-2DP, Polybutadiene, hydroxy- and tetramethylpiperidinyloxy-  
terminated  
RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT  
(Reactant or reagent)  
(oligomeric; prepn. of telechelic diene oligomers)
- IT 101-68-8DP, polymer with hydroxy-terminated polybutadiene  
RL: PNU (Preparation, unclassified); PREP (Preparation)  
(prepn. and reaction of telechelic diene oligomers)
- IT 188526-94-5 188707-72-4 200345-03-5  
200345-05-7  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(in prepn. of telechelic diene oligomers)
- RN 188526-94-5 HCAPLUS
- CN Nitroxide, 1-(diethoxyphosphinyl)-2,2-dimethylpropyl 1,1-dimethylethyl  
(9CI) (CA INDEX NAME)



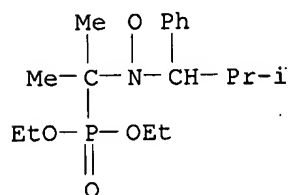
RN 188707-72-4 HCAPLUS  
 CN Nitroxide, 1-[bis(phenylmethoxy)phosphinyl]-2,2-dimethylpropyl  
 1,1-dimethylethyl (9CI) (CA INDEX NAME)



RN 200345-03-5 HCAPLUS  
 CN Nitroxide, 1-(diethoxyphosphinyl)-2,2-dimethylpropyl phenyl (9CI) (CA  
 INDEX NAME)



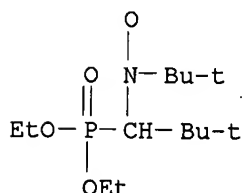
RN 200345-05-7 HCAPLUS  
 CN Nitroxide, 1-(diethoxyphosphinyl)-1-methylethyl 2-methyl-1-phenylpropyl  
 (9CI) (CA INDEX NAME).



L32 ANSWER 56 OF 59 HCAPLUS COPYRIGHT 2003 ACS  
 AN 1997:224565 HCAPLUS  
 DN 126:238706  
 TI Controlled **free-radical polymerization** in  
 the presence of a novel asymmetric nitroxyl radical

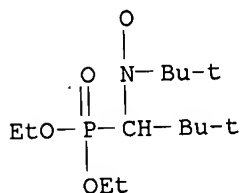
- AU Benoit, Didier; Grimaldi, Sandra; Finet, Jean Pierre; Tordo, Paul; Fontanille, Michel; Gnanou, Yves
- CS Lab. Chimie Polymers Organiques, UMR CNRS-ENSCP-Univ. Bordeaux I, Talence, 33402, Fr.
- SO Polymer Preprints (American Chemical Society, Division of Polymer Chemistry) (1997), 38(1), 729-730  
CODEN: ACPPAY; ISSN: 0032-3934
- PB American Chemical Society, Division of Polymer Chemistry
- DT Journal
- LA English
- CC 35-3 (Chemistry of Synthetic High Polymers)
- AB An analog of di-tert-Bu nitroxyl (DTBN) radical, with a functional group purposely introduced to induce both electronic and steric effects, was used in controlled living **free-radical polymn** of various monomers. N-tert-butyl-1-diethylphosphono-2,2-dimethylpropyl nitroxyl (DEPN) is a stable radical that increases the rate of **polymn.** of styrene better than that mediated by DTBN, yet provides excellent control of mol. wt. distribution to obtain polymers of low polydispersity index. DEPN also is suitable as reversible trapping agent for alkyl **acrylates**, through fully controlled processes. Di- and triblock copolymers based on polystyrene and poly(alkyl **acrylates**) were obtained by sequential **polymn.** of the corresponding monomers.
- ST ethylphosphonodimethylpropyl nitroxyl radical inhibitor living **polymn**; styrene **free radical polymn** nitroxyl control; **acrylate polymn** polydispersity nitroxyl radical
- IT **Polymerization** catalysts  
(living, **radical**, trapping agents; controlled **free-radical polymn.** of styrene and alkyl **acrylates** with asym. nitroxyl radical reversible trapping agent)
- IT **Polymerization**  
**Polymerization** kinetics  
(living, **radical**; controlled **free-radical polymn.** of styrene and alkyl **acrylates** with asym. nitroxyl radical reversible trapping agent)
- IT Molecular weight  
(polydispersity; controlled **free-radical polymn.** of styrene and alkyl **acrylates** with asym. nitroxyl radical reversible trapping agent)
- IT **Polymerization** inhibitors  
(**radical**, trapping agents; controlled **free-radical polymn.** of styrene and alkyl **acrylates** with asym. nitroxyl radical reversible trapping agent)
- IT 9003-49-0P, Poly(n-butyl **acrylate**) 9003-53-6P, Polystyrene  
RL: SPN (Synthetic preparation); PREP (Preparation)  
(controlled **free-radical polymn.** of styrene and alkyl **acrylates** with asym. nitroxyl radical reversible trapping agent)
- IT 110772-34-4P, Butyl **acrylate**-styrene block copolymer  
RL: SPN (Synthetic preparation); PREP (Preparation)  
(diblock and triblock; controlled **free-radical polymn.** of styrene and alkyl **acrylates** with asym. nitroxyl radical reversible trapping agent)
- IT 2406-25-9, DTBN 188526-94-5, N-tert-Butyl-1-diethylphosphono-2,2-dimethylpropyl nitroxyl **radical**

RL: CAT (Catalyst use); USES (Uses)  
 (polymn. control; controlled free-radical  
 polymn. of styrene and alkyl acrylates with asym.  
 nitroxyl radical reversible trapping agent)  
 IT 188526-94-5, N-tert-Butyl-1-diethylphosphono-2,2-dimethylpropyl  
 nitroxyl radical  
 RL: CAT (Catalyst use); USES (Uses)  
 (polymn. control; controlled free-radical  
 polymn. of styrene and alkyl acrylates with asym.  
 nitroxyl radical reversible trapping agent)  
 RN 188526-94-5 HCAPLUS  
 CN Nitroxide, 1-(diethoxyphosphinyl)-2,2-dimethylpropyl 1,1-dimethylethyl  
 (9CI) (CA INDEX NAME)

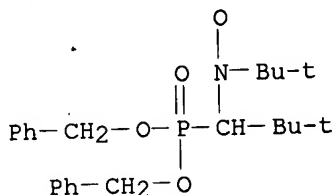


L32 ANSWER 57 OF 59 HCAPLUS COPYRIGHT 2003 ACS  
 AN 1997:224454 HCAPLUS  
 DN 126:251457  
 TI Synthesis and applications to living free radical  
 polymerization of a new class of nitroxyl radicals  
 AU Grimaldi, Sandra; Finet, Jean-Pierre; Zeghdaoui, Abdelhamid; Tordo, Paul;  
 Benoit, Didier; Gnanou, Yves; Fontanille, Michel; Nicol, Pascal; Pierson,  
 Jean-Francis  
 CS Lab. Structure Reactivite, Universite Aix-Marseille I, Marseille, 13397,  
 Fr.  
 SO Polymer Preprints (American Chemical Society, Division of Polymer  
 Chemistry) (1997), 38(1), 651-652  
 CODEN: ACPPAY; ISSN: 0032-3934  
 PB American Chemical Society, Division of Polymer Chemistry  
 DT Journal  
 LA English  
 CC 35-3 (Chemistry of Synthetic High Polymers)  
 AB Styrene was subjected to living radical polymn. in the presence of  
 (RO)2P(O)CH(Bu-tert)N(Bu-tert)O.bul. (R = Et, benzyl) as chain-transfer  
 agents. The control of the reaction was better than with TEMPO.  
 ST nitroxyl chain transfer agent styrene polymn  
 IT Chain transfer agents  
 (living radical polymn. of styrene in presence of nitroxyl agents)  
 IT Polymerization  
 Polymerization  
 (living, radical; of styrene in presence of nitroxyl chain-transfer  
 agents)  
 IT 188526-94-5P 188707-72-4P  
 RL: CAT (Catalyst use); SPN (Synthetic preparation); PREP (Preparation);  
 USES (Uses)  
 (living radical polymn. of styrene in presence of nitroxyl  
 chain-transfer agents)  
 IT 9003-53-6P, Polystyrene

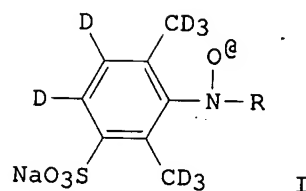
RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)  
 (living radical polymn. of styrene in presence of nitroxyl  
 chain-transfer agents)  
 IT 188526-94-5P 188707-72-4P  
 RL: CAT (Catalyst use); SPN (Synthetic preparation); PREP (Preparation);  
 USES (Uses)  
 (living radical polymn. of styrene in presence of nitroxyl  
 chain-transfer agents)  
 RN 188526-94-5 HCAPLUS  
 CN Nitroxide, 1-(diethoxyphosphinyl)-2,2-dimethylpropyl 1,1-dimethylethyl  
 (9CI) (CA INDEX NAME)



RN 188707-72-4 HCAPLUS  
 CN Nitroxide, 1-[bis(phenylmethoxy)phosphinyl]-2,2-dimethylpropyl  
 1,1-dimethylethyl (9CI) (CA INDEX NAME)



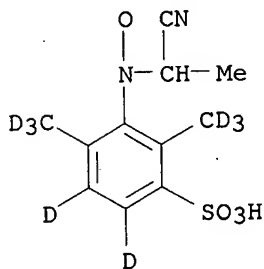
L32 ANSWER 58 OF 59 HCAPLUS COPYRIGHT 2003 ACS  
 AN 1984:473143 HCAPLUS  
 DN 101:73143  
 TI Vinyl polymerization. 422. **Initiation** mechanism of uncatalyzed  
 polymerization by polyethylene glycol  
 AU Ouchi, Tatsuro; Hosaka, Yoshifumi; Imoto, Minoru; Konaka, Ryusei  
 CS Fac. Eng., Kansai Univ., Senriyama, 564, Japan  
 SO Journal of Polymer Science, Polymer Chemistry Edition (1984), 22(6),  
 1507-14  
 CODEN: JPLCAT; ISSN: 0449-296X  
 DT Journal  
 LA English  
 CC 35-3 (Chemistry of Synthetic High **Polymers**)  
 Section cross-reference(s): 77  
 GI



- AB The **initiation** mechanism of radical **polymn.** of vinyl monomers (i.e., **acrylonitrile** [107-13-1], **acrylonitrile** -d1 [91289-87-1], **methacrylonitrile** [126-98-7], Me **acrylate** [96-33-3], and Me **methacrylate** [80-62-6]) by polyethylene glycol (II) [25322-68-3] (PEG-300) in aq. soln. was studied. The **initiating** radical species, detd. by spin trapping with Na 2,4-dimethyl-3-nitrosobenzenesulfonate-d8 (III) [81734-87-4], were concluded to be generated by the H atom transfer from the monomer adsorbed at the ether group of II to the free monomer. The ESR spectra of several **initiating** radical species were assigned structure I in which R is derived from the above monomers. For example, for the **initiation** of **methacrylonitrile** **polymn.**, R had the structures CH<sub>2</sub>C(CN):CH<sub>2</sub> and C(Me)<sub>2</sub>CN. Assignments and mechanism were confirmed by photolysis of some model compds. (e.g., propionitrile [107-12-0] or Me propionate [554-12-1]) with H<sub>2</sub>O<sub>2</sub> in the presence of III.
- ST vinyl **polymn** polyoxyethylene radical trapping; spin trapping nitrobenzenesulfonate vinyl **polymn**; **acrylonitrile** polyoxyethylene **initiation** radical trapping; **methacrylonitrile** polyoxyethylene **initiation** radical trapping; **acrylate** polyoxyethylene **initiation** radical trapping; **methacrylate** polyoxyethylene **initiation** radical trapping; ESR vinyl **polymn** **initiation**
- IT Spin labels  
(nitroxide, reaction of, with intermediates in vinyl **polymn.**)
- IT Photolysis  
(of esters and nitriles in presence of hydrogen peroxide and nitrosobenzenesulfonate trapping agent)
- IT Electron spin resonance  
(of radical-trapped intermediates in vinyl **polymn.**)
- IT Polymerization  
(of vinyl monomers in presence of polyethylene glycol, **initiation** in, ESR of and radical trapping in)
- IT Kinetics of polymerization  
(of vinyl monomers, in presence of polyethylene glycol, ESR of and radical trapping in relation to)
- IT Vinyl compounds, reactions  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(**polymn.** of, **initiation** in, ESR of and radical trapping in)
- IT Addition reaction  
(spin trapping, of intermediates in vinyl **polymn.** **initiation**, ESR of)
- IT 91289-77-9 91289-78-0 91289-79-1 91289-80-4  
91289-81-5 91289-83-7 91289-84-8 91289-85-9  
91289-86-0  
RL: PRP (Properties)  
(ESR of, in **initiation** of **polymn.** in presence of polyethylene glycol)

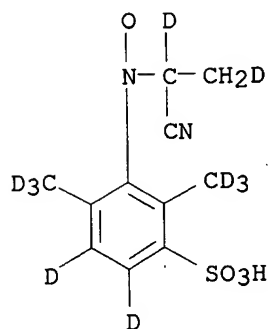


- IT 91289-82-6  
 RL: PRP (Properties)  
 (ESR of, in photolysis of methacrylonitrile with aq. hydrogen peroxide)
- IT 25322-68-3  
 RL: CAT (Catalyst use); USES (Uses)  
 (catalysts, for vinyl polymn., radical intermediates from)
- IT 7722-84-1, uses and miscellaneous  
 RL: USES (Uses)  
 (photolysis of acrylic monomers in presence of nitrosobenzenesulfonate trapping agents and, ESR spectra of products from)
- IT 107-12-0 547-63-7 554-12-1  
 RL: RCT (Reactant); RACT (Reactant or reagent)  
 (photolysis of, in presence of hydrogen peroxide and nitrosobenzenesulfonate trapping agent, ESR spectra of products from)
- IT 80-62-6 96-33-3 107-13-1, reactions 126-98-7 91289-87-1  
 RL: RCT (Reactant); RACT (Reactant or reagent)  
 (reaction of, with nitrosobenzenesulfonate in presence of polyethylene glycol, radical observation in)
- IT 81734-87-4  
 RL: USES (Uses)  
 (trapping agents, for radicals in initiation of polymn. of vinyl monomers)
- IT 91289-78-0 91289-79-1 91289-80-4  
 91289-84-8 91289-85-9  
 RL: PRP (Properties)  
 (ESR of, in initiation of polymn. in presence of polyethylene glycol)
- RN 91289-78-0 HCAPLUS  
 CN Nitroxide, 1-cyanoethyl 2,6-di(methyl-d3)-5-sulfohenyl-3,4-d2, sodium salt (9CI) (CA INDEX NAME)



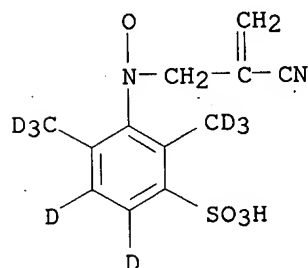
● Na

- RN 91289-79-1 HCAPLUS  
 CN Nitroxide, 1-cyanoethyl-1,2-d2 2,6-di(methyl-d3)-5-sulfohenyl-3,4-d2, sodium salt (9CI) (CA INDEX NAME)



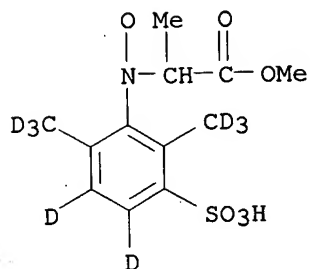
● Na

RN 91289-80-4 HCAPLUS  
 CN Nitroxide, 2-cyano-2-propenyl 2,6-di(methyl-d3)-5-sulfophenyl-3,4-d2,  
 sodium salt (9CI) (CA INDEX NAME)



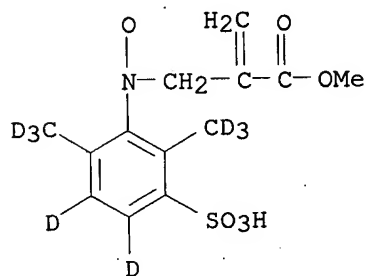
● Na

RN 91289-84-8 HCAPLUS  
 CN Nitroxide, 2,6-di(methyl-d3)-5-sulfophenyl-3,4-d2 2-methoxy-1-methyl-2-  
 oxoethyl, sodium salt (9CI) (CA INDEX NAME)



● Na

RN 91289-85-9 HCAPLUS  
 CN Nitroxide, 2,6-di(methyl-d3)-5-sulfophenyl-3,4-d2 2-(methoxycarbonyl)-2-propenyl, sodium salt (9CI) (CA INDEX NAME)



● Na

L32 ANSWER 59 OF 59 HCAPLUS COPYRIGHT 2003 ACS

AN 1959:54056 HCAPLUS

DN 53:54056

OREF 53:97181,9719a

TI Polymerizations and polymerization catalysts. IX. Mercaptans and thiophenols as polymerization catalysts

AU Bredereck, Hellmut; Wagner, Adolf; Rochlitz, Fritz; Iliopoulos, Miltiadis Ioannu; Kottenhahn, Alfred; Wulz, Hans Gunther

CS Tech. Hochschule, Stuttgart, Germany

SO Makromolekulare Chemie (1959), 29, 131-8

CODEN: MACEAK; ISSN: 0025-116X

DT Journal

LA Unavailable

CC 31 (Synthetic Resins and **Plastics**)

AB Mercaptans and thiophenols **initiate** the block polymerization of vinyl compds. in the presence of Cl ions and O.

IT Thiols

(catalysts, in polymerization of vinyl compds.)

IT Catalysts

KATHLEEN FULLER EIC 1700/PARKER LAW 308-4290

- (in polymerization, of vinyl compds., thiols as)
- IT Polymerization  
(of vinyl compds., thiols as catalysts in)
- IT Vinyl compounds  
(polymerization of, thiols as catalysts in)
- IT Piperidine, 1-[[1-naphthylthio]methyl]-  
Piperidine, 1-[[2-naphthylthio]methyl]-  
(as catalysts in vinyl compd. polymerization)
- IT 1,4-Butanediol, homopolymer  
(thiols as catalysts in)
- IT 79-41-4, **Methacrylic** acid  
(and esters, **polymerization** of, thiols as catalysts in)
- IT 112-55-0, 1-Dodecanethiol 100875-50-1, Acetanilide, 4'-  
(piperidinomethylthio)- 103396-60-7, 1,6-Hexanediamine,  
N,N,N',N'-tetrakis[(phenylthio)methyl]- 122337-02-4, 1,6-Hexanediamine,  
N,N,N',N'-tetrakis(p-tolylthiomethyl)-  
(as catalyst in polymerization of vinyl compds.)
- IT 100-53-8, .alpha.-Toluenethiol 1569-69-3, Cyclohexanethiol 1639-09-4,  
1-Heptanethiol 6258-60-2, .alpha.-Toluenethiol, p-methoxy- 13865-52-6,  
Diethylamine, N-[(phenylthio)methyl]- 14041-26-0, Diethylamine,  
N-[(p-chlorophenylthio)methyl]- 22959-43-9, Diethylamine,  
N-[(p-bromophenylthio)methyl]- 25508-57-0, Diethylamine,  
N-(p-tolylthiomethyl)- 26445-03-4, ar-Toluenethiol 58199-25-0,  
Diethylamine, N-[(1-naphthylthio)methyl]- 70227-32-6, Morpholine,  
4-(p-tolylthiomethyl)- 104176-84-3, Ethylenediamine,  
N,N,N',N'-tetrakis[(phenylthio)methyl]- 110155-22-1, Piperidine,  
1,1'-[p-phenylenebis(thiomethylene)]di- 112508-58-4, Benzylamine,  
N-cyclohexyl-N-(p-tolylthiomethyl)-  
(as catalyst in vinyl compd. polymerization)
- IT 108-98-5, Benzenethiol  
(catalyst, in polymerization of vinyl compds.)
- IT 75-66-1, 2-Propanethiol, 2-methyl-  
(catalysts, in vinyl compd. polymerization)
- IT 79-10-7, **Acrylic** acid  
(**polymerization** of (and **acrylic** acid derivatives),  
thiols as catalysts in)
- IT 107-13-1, **Acrylonitrile** 109-17-1, Tetraethylene glycol,  
**dimethacrylate**  
(**polymerization** of, thiols as catalysts in)
- IT 15792-01-5, Dibutylamine, N-[(phenylthio)methyl]- 52716-32-2,  
Trimethylamine, 1,1'-bis(p-tolylsulfonyl)- 116602-06-3, Cyclohexylamine,  
N,N-bis(p-tolylthiomethyl)- 117876-56-9, Trimethylamine, p-tolylthio-  
119505-96-3, Ethylenediamine, N,N,N',N'-tetrakis(p-tolylthiomethyl)-  
(prepn. and use as catalyst in polymerization of vinyl compds.)
- IT 25508-63-8, Piperidine, 1-(p-tolylthiomethyl)- 100618-00-6, Piperidine,  
1-[(p-methoxyphenylthio)methyl]- 108923-72-4, Methanol, p-tolylthio-  
109563-25-9, Triethylamine, 1-p-tolylthio- 110555-18-5, Cyclohexylamine,  
N-phenyl-N-(p-tolylthiomethyl)- 113977-08-5, Ethanol, 1-p-tolylthio-  
(prepn. and use as catalyst in vinyl compd. polymerization)
- IT 108875-93-0, Pyrrolidine, 1-(p-tolylthiomethyl)- **114960-33-7**,  
Hydroxylamine, N-methyl-N-(p-tolylthiomethyl)- 116865-59-9, 1-Butanol,  
1-p-tolylthio-  
(prepn. of)
- IT 119641-19-9, 1-Naphthylamine, N,N-bis(p-tolylthiomethyl)-  
(prepn. of, and use as catalyst in polymerization of vinyl compds.)
- IT 109564-50-3, Ethylamine, N,N-bis(p-tolylthiomethyl)-  
(prepn. of, and use as polymerization catalyst for vinyl compds.)
- IT **114960-33-7**, Hydroxylamine, N-methyl-N-(p-tolylthiomethyl)-

(prepn. of)

RN 114960-33-7 HCAPLUS

CN Hydroxylamine, N-methyl-N-(p-tolylthiomethyl)- (6CI) (CA INDEX NAME)

